MAST, FOOS & CO.

SPRINGFIELD, O.

SMITH & WINCHESTER,

SOLE NEW ENGLAND AGENTS,

19 to 31 Wendell St., BOSTON.

#620 150-

# MAST, FOOS & CO.,

## SPRINGFIELD, OHIO, U. S. A.,

——MANUFACTURERS OF——

# BUCKEYE FORCE PUMPS,

IRON TURBINE WIND ENGINES, BUCKEYE IRON FENCE,
BUCKEYE SENIOR & JUNIOR LAWN MOWERS, ETC.

## BRANCH HOUSES.

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P. P. MAST & CO., { N. W. cor. Thirteenth and Willow Sts., *PHILADELPHIA, PA*

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1888

JULY, 1888.

# SPECIAL NOTICE.

This Catalogue and Price List supersede all previous ones.

Quotations are for immediate acceptance only, unless otherwise agreed, and are subject to change without notice.

All orders from unknown correspondents must be accompanied by cash, draft or post office order, or undoubted reference as to responsibility.

When ordering repairs, be particular to give the full description of the part wanted. Each casting is marked with a combination of letters and figures. Always give the mark on the broken piece. If the article wanted is of such a character that it cannot be marked, give full description as stated in our pump repair list.

No goods sent on consignment or trial.

The reputation of the Buckeye Pump is fully established, there being over 200,000 in use. They are fully warranted to be what they are represented, and will work satisfactorily if put in according to directions given in catalogue.

Thankful for past favors, we hope by a strict attention to the wants of the public to merit a continuance of the same.

MAST, FOOS & CO.

# GENERAL REMARKS.

Although an article of universal use at the present time for raising water, Pumps are but superficially understood, except by the few who make it a business to manufacture, or to set and repair them for others.

A Pump is comprised of a cylinder, plunger, check-valve and suction, or connection pipe. These four sections are the more essential parts forming the Pump. By the omission of one of them the Pump is incomplete. Let either of them become deranged, and no water can be elevated from any considerable depth. The character and extent of such derangement can be easily determined by the practical pump-maker or setter; but the proper adjustment often baffles the skill of the unpracticed hand, although he may be a mechanic.

The cylinder, being the first essential, should be perfectly air tight, with smooth and parallel sides. The plunger must exactly fit the cylinder, so as to exclude all air from it in the upward passage of the plunger, allowing none to pass its sides and enter the vacuum made below. Good judgment must be exercised in fitting the plungers to the cylinder after the leathers of the plungers have been soaked. If fitted too tightly, it will greatly add to the labor of pumping. If adjusted too loosely, a perfect vacuum cannot be created. The check-valve should be constructed of the best and smoothest portions of leather, in connection with a perfectly smooth surface for a valve seat, in order that the union of the valve and its seat may be complete. The Patent Brass Valve Seat used in the Buckeye forms this union perfectly.

The cylinder, being perfectly sound and true—the plunger a good one and well fitted to the cylinder with a check-valve and seat, as nearly perfect as we have shown that they should be—nothing is now wanting to prevent the pump from producing an almost perfect vacuum at every upward motion of the plunger; but, to raise water, a *perfectly air-tight* tube of suitable material is needed. This last is a prerequisite of such great importance that we disire to especialy impress it upon the minds of all who use Pumps, and its necessity is daily enforced upon us by the seeming thoughtlessness of those who should have been taught better by experience. For iron pipe, the only precaution needed is a thorough examination, when, if found apparently perfect, all remaining to be done is to tightly screw up the joints with gas-fitters' tongs.

Water can not be raised *successfully* by suction more than 18 to 20 feet, although the theoretical distance is 33½ feet. The Suction Pipe may extend horizontally almost any distance if air-tight. We recommend the use of a Foot Valve with a long horizontal Suction Pipe.

Turns and elbows are to be avoided in the Suction or Discharge Pipe, as they cause considerable friction and add to the power required to operate the Pump.

# THE BUCKEYE FORCE PUMP.

The value of a pump is determined by its durability, simplicity, the ease with which it is operated in deep wells, protection from frost in Winter, etc.

The Buckeye Pump possesses all these valuable qualities in a greater degree than any other pump in the market. There are 200,000 of them in use in every part of the country, and the great demand created for them wherever introduced attests their value.

## DURABILITY.

The working and wearing part of a pump is the Cylinder. If that is defective the pump cannot work well, no matter how substantial the balance of the pump may be or how attractive in appearance. The cylinders of the Buckeye are made of Brass, or Iron lined with porcelain, which, being as smooth and hard as glass, do not wear the leather packing of the plungers. We use only the best leather for the valves, and all material used in the manufacture of the Buckeye Pump is calculated to do good service for years. All the New Style Pumps are fitted with our New Patent Brass Valve Seat.

## SIMPLICITY.

We call especial attention to the simplicity of construction of this pump; there is no stuffing or packing box as in most force pumps, and this fact alone should recommend the Buckeye above all others. The valves are simple and substantial, and not liable to clog with sand and dirt.

## EASE OF OPERATION.

As but one half of the water in cylinder is discharged with each motion of the handle, the friction of the water passing through the pipe is greatly reduced. This is an important consideration. They are especially desirable for deep wells, as a woman or child can use them in ordinary wells.

## PROTECTION FROM FROST.

Each pump is provided with a small waste hold, not larger than a darning needle, in the discharge pipe, four feet below the platform, which will always allow the water to settle down to that point in the pipe after pumping, and is a sure protection against frost.

## GENERAL EFFICIENCY.

The water starts with the first or second motion of the handle, and the flow ceases the moment you stop pumping, leaving no drippings to form mud or ice on or around the platform. It throws a steady stream, and will force water 60 feet from the end of the hose nozzle.

## CAPACITY.

The inquiry is often made, "How much water will the Buckeye pump supply in an hour or day?" The answer depends entirely on the length of stroke, size of cylinder and number of strokes per minute. A 4 inch cylinder will furnish nearly double that of a 3 inch, with the same stroke. Below we give a table showing the capacity of the Buckeye:

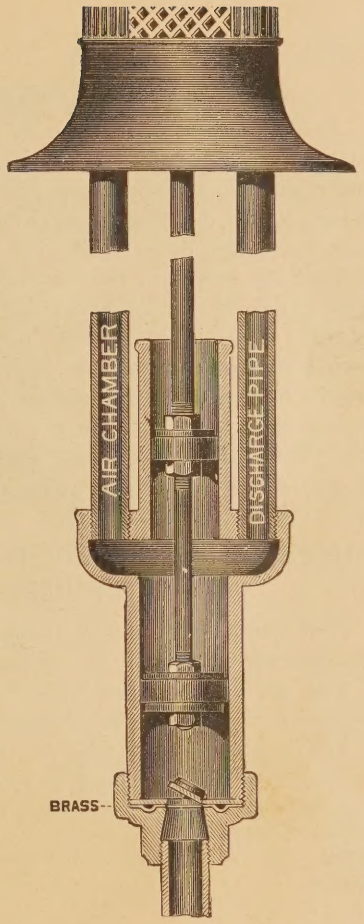
| Size of Cylinder. | Strokes Per Minute. | Length of Stroke. | Gallons Per Hour. |
|---|---|---|---|
| 2¼ inch. | 60 | 5 inch. | 310 |
| 2½ inch. | 60 | 5 inch. | 375 |
| 3 inch. | 60 | 5 inch. | 569 |
| 3½ inch. | 60 | 5 inch. | 750 |
| 4 inch. | 60 | 5 inch. | 980 |
| 5 inch. | 60 | 5 inch. | 1,530 |
| 6 inch. | 60 | 5 inch. | 2,200 |

## PROTECTION FROM FIRE.

Each pump is provided with a hose coupling which can be instantly attached to the spout, and water forced to any part of the buildings or grounds. It is invaluable in case of fire—an engine ever ready at your door. John H. Beecher, Esq., General Agent of the Ohio Farmers' Insurance Co., says: "Having made a careful examination of the Buckeye Force Pump, I take pleasure in recommending it to all owners of buildings. It possesses great power, easily throwing water on the top of ordinary buildings. The use of the Buckeye in cases of fire would be of untold value." It is very convenient for washing buggies, sprinkling lawns, watering flower beds, washing windows and like purposes.

## Description of Working Parts.

The accompanying cut (Fig. 1) illustrates the cylinder or working part of our pump. It will be observed that the upper part of the cylinder is the smallest, being one-half the capacity of the lower part. The cylinder is provided with two plungers connected together with an iron rod. The upper plunger is solid, and the pressed leather packing fits the cylinder closely, which prevents the water escaping out of the top of the cylinder. The lower plunger also fits nicely, and has a valve which opens on the down stroke and allows the water to pass through and closes on the up stroke.




Sectional View of Cylinder.

## OPERATION OF WORKING PARTS.

As the plungers start on the up stroke the upper plunger makes room for one-half of the water in the cylinder, and the other half is forced out through the discharge pipe. On the return stroke the upper plunger forces the water in that part of the cylinder down again, but as the water is rushing through the valves in the lower plunger the surplus must pass up through the discharge pipe; so it will be seen that a constant stream is kept flowing through the discharge pipe with both movements of the handle, thereby greatly reducing the friction of the water on the pipes, which is the principal reason why the Buckeye Pump works so easily. One of the pipes which supports the cylinder acts as an air chamber which keeps the flow of water steady, and adds greatly to its efficiency when using a hose and nozzle.

## RULES TO BE OBSERVED—SHALLOW WELL PUMPS.

Never put a pump in a well of greater depth than it is designed for—it will be an annoyance and expense to you if you do, and will not work well. Always use the size Suction Pipe designated on circulars.

The cylinder should never be over 20 feet from end of Suction Pipe for the pump to work easy; therefore, after ascertaining depth of well, select the pump suited for that depth, of such size cylinder as may be desired, and pumping water with the Buckeye will be a pleasure instead of hard work.

See that the small waste hole is open to prevent freezing.

Never let the cylinder or end of Suction Pipe, or Strainer, rest on the bottom of the well, as sand, dirt or gravel are liable to be drawn into the cylinder and destroy the valves.

It is advisable to use a foot valve on the bottom of the suction pipe when the pump is required to draw water a long distance.

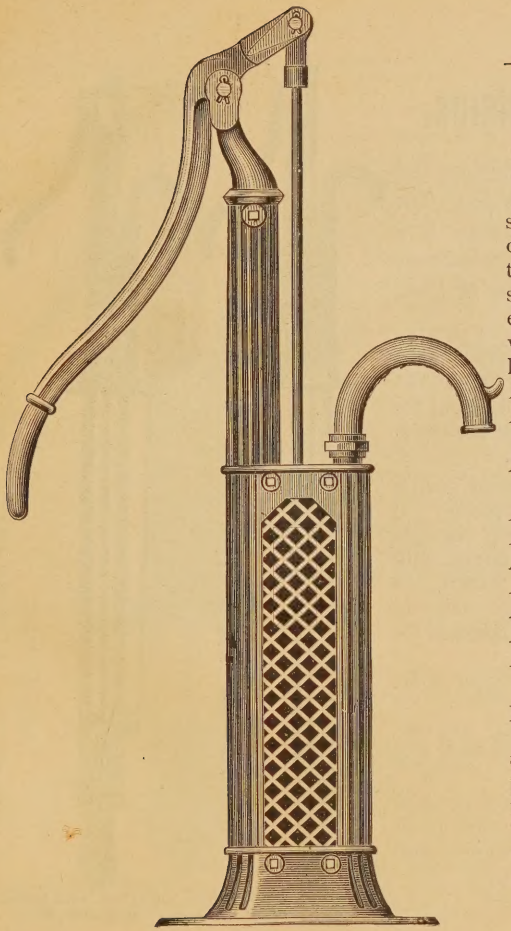
In drove wells always use an old pump to suck out the sand around the bottom of the pipe before setting the Buckeye.

## RULES TO BE OBSERVED—DEEP DUG WELLS.

We recommend that the lower cylinder be placed in the water within 6 to 9 inches of the bottom of the well, with no suction pipe below cylinder, as the valves will then be always submerged and not so liable to get out of order.

The upper cylinder is one-half the capacity of the lower one, *and no change of cylinders should ever be made.* Each pump MUST be used with its appropriate cylinder as designated in list. The substitution of a different sized lower cylinder than that mentioned on the list effectually destroys the mechanical principle on which the pump is made, causes the pump to work unevenly, breaks the constant stream and will fail to give satisfaction. It is poor economy to use smaller pipe for connecting cylinders than that mentioned in our price list. Smaller pipe causes the pump to work hard, and it is impossible to obtain the best results when it is used.

Never allow Strainer or Cylinder to rest on the bottom of the well.



# Buckeye Force Pump, with Patent Brass Valve Seat.

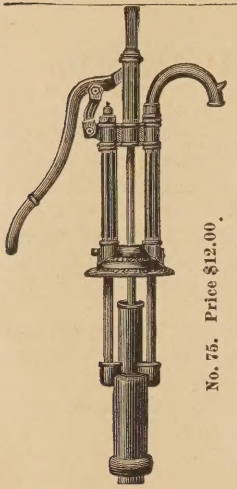
As shown by the cut on page 5, the cylinder has two supports, one for each side. Said supports not only act as such, but also as discharge pipe and air chamber, each opening separately between the pistons of unequal diameters, thereby constituting the easiest working as well as the most durable and strongest pump offered to the public. These features are patented and owned exclusively by us. If you ever contemplate using or buying a pump, first beware of imitators and infringers, then see if the pump you buy has all the following advantages combined in one, namely:

A FORCE PUMP having the top of its cylinder at least 4 feet below platform.
A FORCE PUMP having its cylinder and pistons of unequal diameters, supported on each side.
A FORCE PUMP having its tubular air chamber opening directly between the pistons. This is of the greatest importance.
A FORCE PUMP that throws an even stream at the spout.
A FORCE PUMP that has a brass valve seat.
A FORCE PUMP that has porcelain or brass cylinders.
A FORCE PUMP that has a ventilating top.
A FORCE PUMP that never freezes.
A FORCE PUMP that has no packing box.
A FORCE PUMP that you can use easily with a hose.

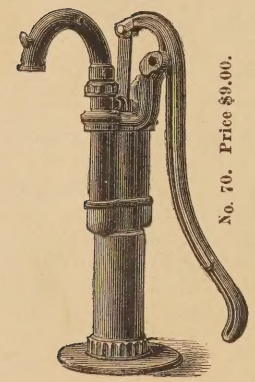
We have in use about 200,000, the largest number of any one kind of force pumps ever sold.

When the Buckeye was first introduced, there was not a similar double acting pump on the market. Since we have succeeded in convincing the people that our plan of construction was the only thoroughly successful and reliable one, many o her concerns have made various attempts at imitation. The mere fact that others are so anxious to secure one so near like ours, and that our sales have been larger than those of any one force pump in the world, are enough to prove that we have the best.

# Buckeye Pumps for Use in Cisterns.



No. 75. Price $12.00.



No. 70. Price $9.00.

The variety of Pumps shown on this page represents our line used for cisterns; they also can be used for shallow wells. The No. 75 has a three inch cylinder two feet below platform. It is only adapted to be set upon a sink or stand, and is very convenient in green-houses, or for filling reservoirs by the use of hose, as well as for protection against fire.

The No. 70 has the same size cylinder, but it is located above the base. Both are double acting and pump a continuous stream.

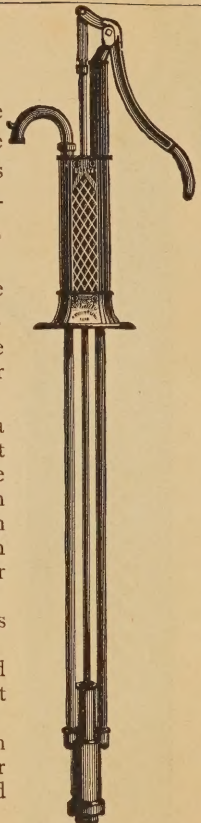
In order to keep the No. 70 and No. 75 from freezing the handle must be raised and the valve tripped so that the water can run down.

In all cases where circumstances will admit the use of such a pump as is shown by No. 201 it is by all means preferable. It has the cylinder down below freezing point and will regulate itself so far as freezing is concerned. The No. 201 pump, with three-way cock attachment, illustrates the manner of making an attachment for having water delivered some distance away in tanks, or at the spout as desired. All these are well adapted for throwing water with the hose.

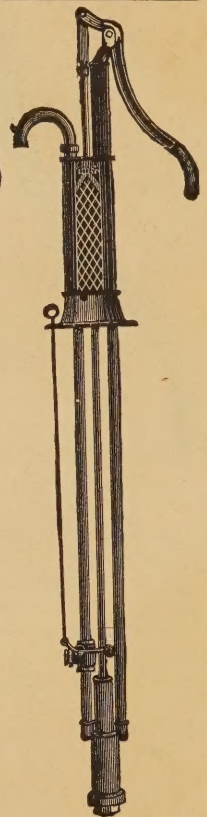
The price named is for pump only. The price of pipe varies according to the length and size required.

If larger size pumps are wanted, see our Nos. 204, 254 and 100, which are also adapted for cistern purposes where five feet set lengths can be used.

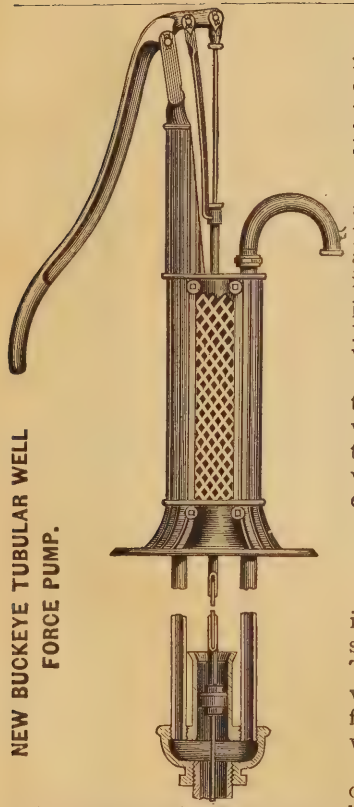
In the BUCKEYE PUMP the top is made with lattice or open work to clamp and secure two pipes which connect to the lower part of pump. Trembling and sagging are thus prevented and good ventilation secured.



No. 201. Price $14.



No. 201, with three-way cock, $17.



NEW BUCKEYE TUBULAR WELL FORCE PUMP.

(Price on Head only, without lower cylinder.)
**No. 29, for hand use only, Price $13.00.**
**No. 129, for hand or wind mill, $14.00.**

No. 29 represents our new BUCKEYE PUMP HEAD adapted and made especially for tubular wells, fitted to receive two inch pipe or smaller. Length of stroke, nine inches. We do not furnish the lower cylinder unless specially ordered, and in no case any larger than two inches. The price list is only for the head. Three-way cock can be used same as shown in No. 201.

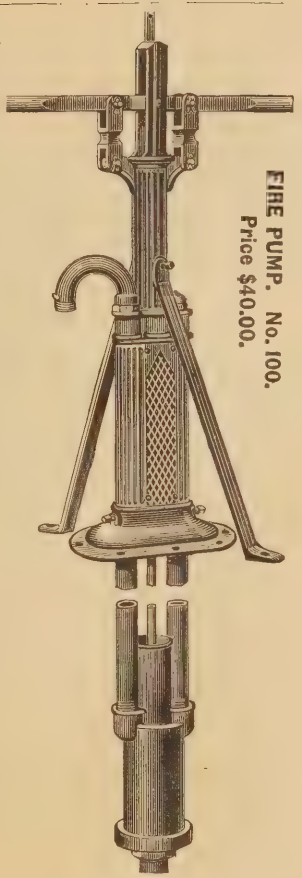
This pump not only throws a continuous stream but is constructed so the plungers can be removed without disturbing the pump and is fitted for either hand or wind mill use. It is also so constructed that, when used in connection with wind mill, it is single acting. While it is a fact that double acting force pumps are superior as hand pumps, to single acting force pumps, yet there are a class of users who prefer the latter kind of pump when it is to be operated by a wind engine.

Therefore, to meet the demands of this class, we disconnect the longer rod from the handle and attach it to the pitman of a wind engine, allowing the upper plunger to remain still and close the upper end of the cylinder, in which instance the pump is converted into a single acting lift pump. These features are patented and owned by us exclusively.

## *BUCKEYE FIRE PUMP.*

No. 100 represents our village or fire pump. It has a five inch cylinder 5½ feet below the platform, adapted for 2½ inch suction pipe. It is intended for wells 25 feet deep and under. The spout is threaded for coupling for 1¼ inch hose. It is provided with two iron handles about four feet long, so that two or four men can use it in case of necessity. Thousands of dollars worth of property is saved annually by this pump.

No. 120 has the same size cylinder but is intended for wells over 25 feet deep. It is fitted to place the cylinder down at the bottom of the well. It has two inch pipe between the upper and lower cylinder, and is the same price as No. 100, namely $40.



FIRE PUMP. No. 100.
Price $40.00.

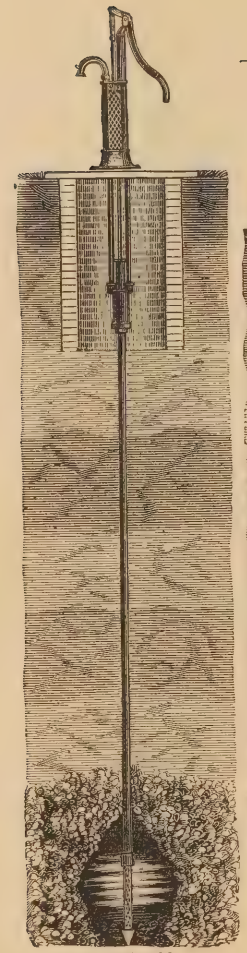


Fig. 28.

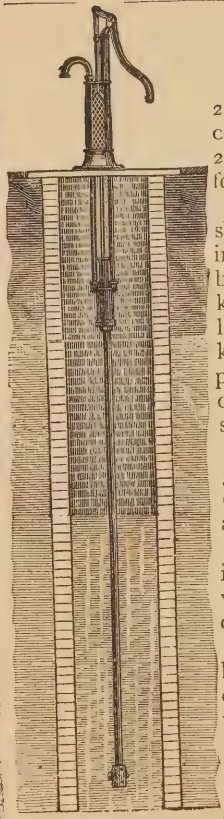


Figure 32.

## BUCKEYE SHALLOW WELL PUMPS.

Figure 32 represents a dug well not over 25 feet deep, and the Buckeye Pump set complete ready for operation. Our Nos. 201, 204, 254 and 100 are specially adapted for this depth wells.

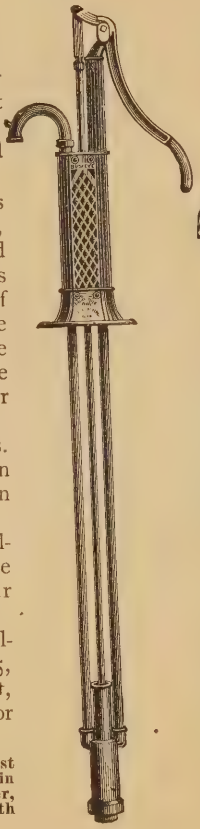
Driven well, represented by Fig. 28, is shown with top dug down and bricked up, in order that the cylinder may be placed below freezing point. In all wells of this kind, we would urge the use of points of large capacity, a so that the cylinder be kept within 20 feet of the lower end of the point. If these two things are observed the driven well pumps will give much better satisfaction.

An open or bored well, as shown by Figs. 32, 33 or 29 is much preferable, and in either of these you can place a pump that in all cases will give satisfaction.

It will be noticed that in Fig. 28, the cylinder cannot be lowered any nearer the water, while in Figs. 33 and 29 the cylinder can be placed down any depth desired.

If Wind Mill Pumps are wanted for shallow wells, we would use Nos. 225, 240, 255, or 257. For wells between 25 and 30 feet, we would use the Nos. 202, 205 or 259; or Wind Mill Top, Nos. 230, 245 or 260.

**In the Buckeye Pump as soon as the handle is at rest the water recedes down to and remains in the porcelain cylinder, free from rust and taste or frost in the winter, and cool in the summer, but ever ready at the spout with the first down stroke of the handle.**



No. 201.

No. 225.

## DIRECTIONS FOR KEEPING IN ORDER.

If the pump loses its priming and the water runs down, the trouble is always below the plunger. Either the check-valve in the bottom of the cylinder is worn out, or something has lodged under it, preventing its closing down on the seat perfectly, or the bottom of the cylinder is not screwed on tight. Either of these causes, although not the fault of the pump, will prevent its working perfectly. If on examination you find that a piece of gravel or dirt has lodged under the check-valve, the suction pipe is probably set too close to the bottom of the well. The valve should wear for years but if after long service it becomes worn out it should be replaced with new, solid leather.

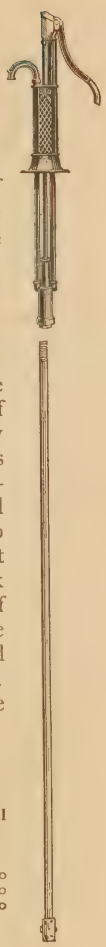
If the pump works hard, and the handle on being pushed down is inclined to jerk back, the suction pipe or strainer is stopped up and will not allow the water to enter the cylinder freely; in such cases it will usually be found that the lower end of the suction pipe or strainer is embedded in the sand or mud at the bottom of the well, or that something floating in the water has stopped up the entrance to the pipe.

If the pump does not throw a full stream, and the water comes out of the spout foamy, some of the joints are loose.

If the pump throws water on the up stroke of the handle, but not on the down stroke, the trouble is with the valve in the lower plunger. If it throws water on the down stroke but not on the up stroke, the trouble is with the check-valve.

## DIRECTIONS FOR SETTING SHALLOW WELL PUMPS.

Stand the pump in a pail or tub of water while the pipe is being prepared, so that the leathers may become thoroughly soaked. Make the platform of the well of 1½ or 2 inch lumber, and firmly secure it to the top of the well. Measure accurately the depth of well from the top of platform to the bottom. Cut the suction pipe 6½ feet shorter for Nos. 201, 204 and 254 pumps, and 10½ feet shorter for Nos. 202, 205 and 359 pumps, than the depth of the well. Fasten strainer on the bottom of the Suction Pipe. Be sure that the joints of the pipe, if any, are screwed up tight, so as not to leak air. Take off the cap from the bottom of the cylinder and screw it tight on top of the suction pipe. Lower the pipes into the well, leaving the cap just above the platform and suspend it there. Screw the pump head on to the cap on end of Suction Pipe and tighten up with a large wrench, so as to form a water tight joint, by means of the outer rim of the leather check valve which forms a packing between the end of the cylinder and the inside of the cap. Fill the cylinder with water, lower pump to place and fasten firmly to platform with bolts or lag screws. Prime the pump by holding a vessel of water to the spout and working the handle.



## PRICE LIST OF SHALLOW WELL PUMPS FOR HAND USE.—(WITH BRASS VALVE SEAT.)

**Pumps are priced without Suction Pipe. If Pipe is wanted, state so in order, giving the depth from the top of the platform to the bottom of the well and the depth of the water in the well in dry seasons.**

**FOR WELLS UNDER 26 FEET DEEP.**

| | |
|---|---|
| No. 201 has a 3 inch cylinder, 5½ feet below the platform | $14 00 |
| No. 204 has a 3½ inch cylinder, 5½ feet below the platform | 16 00 |
| No. 254 has a 4 inch cylinder, 5½ feet below the platform | 17 00 |

**FOR WELLS FROM 26 TO 30 FEET DEEP.**

| | |
|---|---|
| No. 202 has a 3 inch cylinder, 9½ feet below platform | $15 50 |
| No. 205 has a 3½ inch cylinder, 9½ feet below platform | 17 50 |
| No. 259 has a 4 inch cylinder, 9½ feet below platform | 18 50 |

## BUCKEYE DEEP WELL PUMPS.

These illustrations show the different kinds of deep wells with the Buckeye Pump adapted for each. It is important that a deep well pump should be made of the best material, strong and substantial, and that the lower part be so well supported that it will not tremble or sway to one side.

In the Buckeye Deep Well Pump, the top is made with two pipes extending into the well, and the entire weight of the water and lower part is secured by these pipes, one on each side. This not only holds the working parts all strictly in line but maintains the entire pump firmly in its right position, which cannot be accomplished by single or side support. All our deep well pumps throw a continuous stream, and the top is made to ventilate the well, keeping the water pure.

Fig. 30 represents a deep dug well with cylinder near the bottom. Fig. 31 a driven dug well with pipe and point driven down. For this class of wells we would recommend any of the pumps numbered 215 to 234 inclusive, according to the depth and amount of water desired. Fig. 29 shows a dug dry well bored down. We would recommend, in cases where it is necessary to deepen old wells, that this method be adopted wherever possible, as it is much preferable over the style shown in Fig. 31.

Fig. 33 shows a bored well from the top down. In such, a force pump throwing a steady steam of the largest capacity possible for wells of 4 or 5 inch bore, is desired. We recommend for all bored wells, our pumps numbered 415 to 439 inclusive.

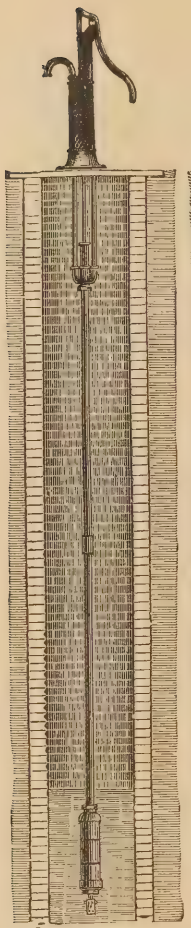


FIGURE 30.

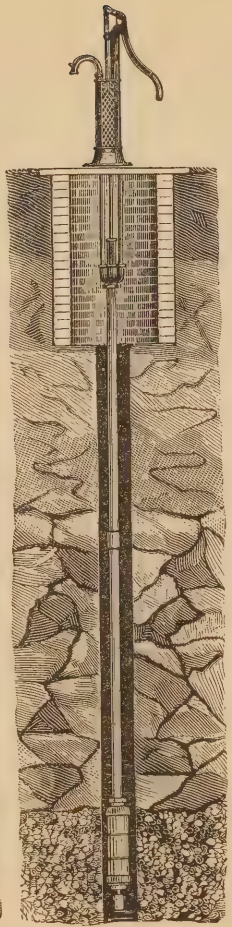


FIGURE 29.

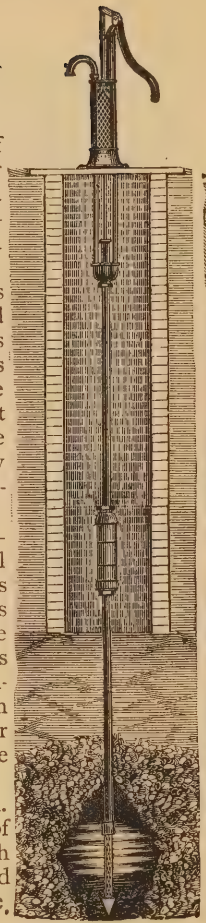


FIGURE 31.

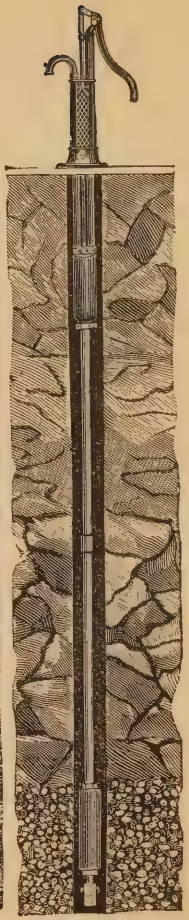


FIGURE 33.

## DIRECTIONS FOR SETTING DEEP WELL PUMPS.

See that all rods and pipe are perfectly straight and that the lower cylinder is in perfect working order. Measure the well accurately and deduct 7½ feet from the deep of the well, which will give the exact amount of pipe to use. Take random lengths of pipe equal to that distance, laying it out in line on the ground, so as to measure it accurately, allowing for threads that will be used in screwing together.

Locate lower cylinder near bottom of well and cut the connecting rods of such length that each joint will come just above the upper end of each length of pipe—having the entire length of the rod just *eight inches* less than the entire length of the pipe when all the joints are screwed tightly together, the ends of the rod uniting in the couplings. Now screw one length of rod on to the plunger rod of the lower cylinder, with a ⅜ nut both above and below the ⅜ rod coupling, the ends of the ⅜ rod meeting in the center of the rod coupling, and the ⅜ inch nut screwed down onto the ends of the coupling; put one length of pipe over the rod and screw it into the cylinder. Then lower the cylinder into the well until the end of the pipe and rod is within reach; screw on another length of rod and pipe as before, and so continue until all are connected, which will leave the top end of last rod a few inches down inside the pipe. Screw on to end of rod temporarily, a short piece of rod, with which draw up the rod, and after removing this short piece connect to plunger rod of pump head. Then screw pump head on to pipe and lower all into position and fasten firmly to platform with screws and bolts.

## Method of Setting Buckeye Pumps in Deep Dug Wells.

WITH DRIVE POINT AND PIPE BELOW LOWER CYLINDER.

AS SHOWN IN FIGURE 31.

Use a radial center drive point, shown on page 24, and pipe of same diameter as the connecting pipe between cylinders of the Buckeye Pump selected for the well. The end of the pipe above the bottom of the dug well should be threaded. Attach a hand or pitcher-top pump to the drove pipe and pump out the sand around the drove point, so as to form a cavity about the size of a barrel, as shown in the cut.

Measure the well from the top of the drove pipe, (allowing half an inch for the joint to the cylinder), and cut and fit pipe and rod as described on this page—Directions for Setting Deep Well Pumps.

Soak the plunger leathers well before setting pump, and if they absorb too much water and bind in the cylinders, pare them off with a very sharp knife until they work easy and perfectly fit the cylinder.

## METHOD OF SETTING BUCKEYE PUMPS IN DEEP DUG WELLS.

AS SHOWN IN FIGURE 30.

This cut shows very plainly the manner a deep well pump is put into a dug well. We invariably recommend that the lower or working cylinder be placed within 6 to 9 inches of the bottom of the well. This is especially desirable when pump is to be run by a wind engine. When set in this way if from any cause the pump loses its priming, a few revolutions of the wheel of the engine will raise the water, and the stock will have an ample supply when they need it. See also that the party from whom you buy a pump gives you the right cylinder. A 2¼ inch inside diameter must be used with a No. 217 and 239; a 2½ with a 218 and 236; a 3 with a 215 and 237, and a 3½ with a 216 and 238 pump. No change of cylinders should ever be made. To insure best results always use size pipe mentioned in list.

# Price List of Deep Well Pumps for Hand Use.

REPRESENTED BY FIGURE 14.

FIGURE 14.

All of the Buckeye Deep Well Pumps have brass upper cylinders, and either porcelain lined, brass, or bored iron lower cylinders. The upper and lower cylinders are connected by pipe, with a rod running through it to connect and operate the upper and lower plungers. We recommend that lower cylinder be placed in the water within 6 to 9 inches of the bottom of the well, as the valves will then be always submerged and not so liable to get out of order. The upper cylinder is one-half the capacity of the lower one, *and no change of cylinders should ever be made.* Each pump MUST be used with its appropriate cylinder as designated below. The substitution of a different sized lower cylinder than that mentioned on the list effectually destroys the mechanical principles on which the pump is made, causes the pump to work unevenly, breaks the constant stream and will fail to give satisfaction. We furnish the following sizes:

## FOR WELLS FROM 30 TO 40 FEET DEEP.

No. 220—4 inch porcelain lined lower cylinder. The bottom of upper cylinder is 5 feet below platform, 2 inch connecting and 1 inch discharge pipe.....$19 50

## FOR WELLS FROM 30 TO 50 FEET DEEP.

No. 216—3½ inch porcelain lined lower cylinder. The bottom of upper cylinder is 5 feet below platform, 1½ inch connecting and 1 inch discharge pipe..... 17 00

No. 216—3½x13 in. brass lower cylinder, capped inside or outside..... 19 00

## FOR WELLS FROM 30 TO 70 FEET DEEP.

No. 215—3 inch porcelain lined lower cylinder. The bottom of upper cylinder is 5 feet below platform, 1¼ inch connecting and ¾ inch discharge pipe..... 15 00

No. 215—With 3x13 inch brass lower cylinder, capped inside or outside..... 17 00

No. 215—With 3x18 inch brass lower cylinder, capped inside or outside..... 18 50

No. 215—With 3x18 inch bored iron lower cylinder, Capped inside..... 18 00

No. 218—2½ inch porcelain lined lower cylinder. The bottom of upper cylinder is 5 feet below platform, 1¼ inch connecting and ¾ inch discharge pipe.....$15 00

No. 218—With 2½x13 in. brass lower cylinder, capped inside or outside..... 17 00

No 218—With 2½x18 in brass lower cylinder, capped inside or outside..... 18 50

## FOR WELLS OVER 70 FEET DEEP.

No. 217—2¼ inch porcelain lined lower cylinder. The bottom of upper cylinder is 5 feet below platform, 1¼ inch connecting and ¾ inch discharge pipe..... 15 00

No. 217—With 2¼x13 in. brass lower cylinder, capped inside or outside..... 17 00

No. 217—With 2¼x18 in. brass lower cylinder, capped inside or outside..... 18 50

No. 217—With 2¼x18 inch bored iron lower cylinder, capped inside..... 18 00

N. B.—Nos. 215, 218 and 217 pumps fitted with ¾ inch Martin patent 3 way cocks at $3 each; Nos. 220 and 216 pumps fitted with 1 in. Martin patent 3 way cocks at $3.50 each, as shown in Figure 21, added to prices quoted.

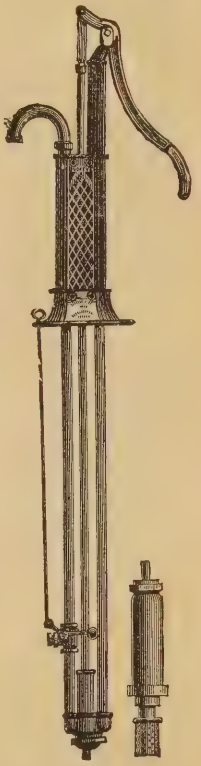


FIGURE 21.

# Buckeye Shallow Well Pumps. — (For Hand and Wind Mill Use.)

**REPRESENTED BY FIGURES 22 AND 23.**

FIGURE 22.

Pumps are priced without suction pipe. If pipe is wanted state in your order whether black or galvanized; also give depth from top of platform to bottom of well, and depth of water in well in dry season.

**FOR WELLS UNDER 26 FEET DEEP.**

| | |
|---|---|
| No. 225—2 inch cylinder, 5½ feet below platform, 1¼ inch suction and ¾ inch discharge pipe | $15 00 |
| No. 225—With Martin patent 3-way cock | 18 00 |
| No. 240—3½ in. cylinder, 4½ feet below platform, 1½ inch suction and 1 inch discharge pipe | 17 00 |
| No. 240—With Martin patent 3-way cock | 20 50 |
| No. 255—4 inch cylinder, 5½ feet below platform, 2 inch suction and 1 inch discharge pipe | 18 00 |
| No. 255—With Martin patent 3-way cock | 21 50 |
| No. 257—5 inch cylinder 5½ feet below platform, 2 inch suction and 1¼ inch discharge pipe | 30 00 |

**FOR WELLS FROM 26 TO 30 FEET DEEP.**

| | |
|---|---|
| No. 230—3 inch cylinder, 9½ feet below the platform, with 1¼ inch suction and ¾ inch discharge pipe | $16 50 |
| No. 230—With Martin patent 3-way cock | 19 50 |
| No. 245—3½ inch cylinder, 9½ feet below the platfore, with 1½ inch suction and 1 inch discharge pipe | 19 00 |
| No. 245—With Martin patent 3-way cock | 22 50 |
| No. 260—4 inch cylinder, 9½ feet below platform, 2 inch suction and 1 inch discharge pipe | 20 50 |
| No. 260—With Martin patent 3-way cock | 24 50 |

We are aware that the high reputation enjoyed by us as manufacturers of the Buckeye Pumps has been largely attained by the closest attention to details in construction, so often overlooked or neglected by manufacturers. In all of our hand pumps we are using a ⅝ cold rolled shafting hinge-pin for handle bearings, secured by spring keys, allowing it to revolve so as to throw the wear uniformly over the entire surface. By a comparison with iron pumps of many other makes you will find a ⅜ or $\frac{5}{16}$ carriage bolt is made to serve in this important place.

The prices given in our lists all include an iron strainer for the lower end of the suction pipe, and our quick acting hose connection to attach hose to spout of pump. In referring to price list of deep well pumps the price includes the lower cylinder and sufficient pipe and plunger rod to set the bottom of upper cylinder 5 feet below the platform, thus decreasing the actual cost of the pump to the dealer or consumer, the value of over 6 feet of pipe and rod or a saving of nearly 10 per cent. on the net cost of the pump head, and bringing the actual cost of our double acting first-class pump down very close to the prices usually charged for inferior single acting force pumps which have no features aside from cheapness to recommend them.

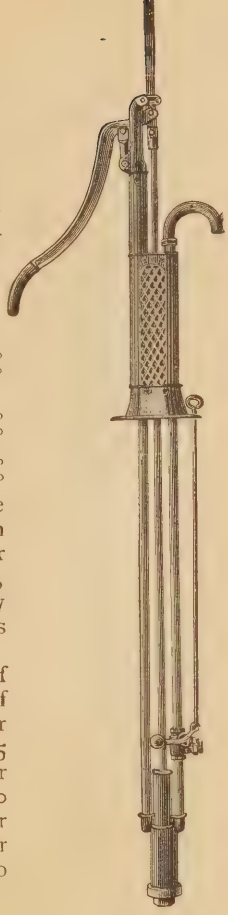


FIGURE 23.

# Price List of Deep Well Pumps with Wind Engine Tops.

## REPRESENTED BY FIGURE 24.

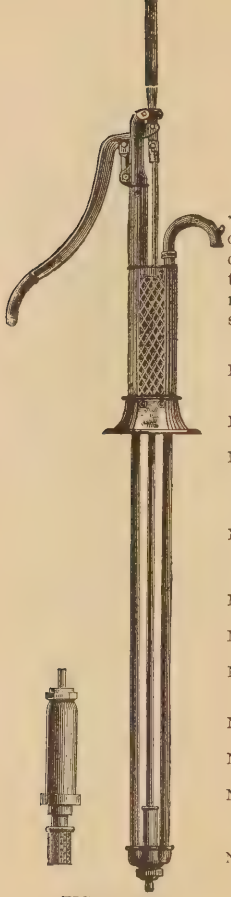


FIGURE 24.

Thousands are now in use and are universally acknowledged to be the best deep well pumps in the country. They have brass upper cylinders, and either porcelain lined, brass or bored iron lower cylinders. Each pump MUST be used with its appropriate cylinder as designated below. The substitution of a different sized lower cylinder than that mentioned on the list effectually destroys the mechanical principles on which the pump is made, causes the pump to work unevenly, breaks the constant stream and will fail to give satisfaction. We furnish the following sizes:

### FOR WELLS FROM 30 TO 40 FEET DEEP.

No. 224—5 in. porcelain lined lower cylinder. The bottom of upper cylinder is 5 ft. below platform, 2 inch connecting and 1¼ inch discharge pipe..$33 00

No. 224 fitted with Martin patent 3-way cock at $5.00 added to above price.

No. 222—4 in. porcelain lined lower cylinder. The bottom of upper cylinder is 5 ft. below platform, 2 inch connecting and 1 inch discharge pipe..... 20 50

### FOR WELLS FROM 30 TO 50 FEET DEEP.

No. 238—3½ inch porcelain lined lower cylinder. The bottom of upper cylinder is 5 ft. below platform, 1½ inch connecting and 1 inch discharge pipe..... 18 00

No. 238—With 3½x13 inch brass lower cylinder, capped inside or outside..... 20 00

Nos. 222 and 238 pumps fitted with 1 inch Martin patent 3 way cocks at $3.50 added to above prices.

No. 237—3 in. porcelain lined lower cylinder. The bottom of upper cylinder is 5 ft. below platform 1¼ in. connecting and ¾ in. discharge pipe..... 16 00

No. 237—With 3x13 inch brass lower cylinder, capped inside or outside..... 18 00

No. 237—With 3x18 in. brass lower cylinder, capped inside or outside ..... 19 50

No. 237—With 3x18 inch bored iron lower cylinder, capped inside..... 19 00

### FOR WELLS FROM 30 TO 70 FEET DEEP.

No. 236—2½ inch porcelain lined lower cylinder. The bottom of upper cylinder is 5 ft. below platform, 1¼ inch connecting and ¾ inch discharge pipe ..... 16 00

No. 236—With 2½x13 inch brass lower cylinder, capped inside or outside.....$18 00

No. 236—With 2½x18 inch brass lower cylinder, capped inside or outside..... 19 50

### FOR WELLS FROM 30 TO 100 FEET DEEP.

No. 239—2¾ inch porcelain lined lower cylinder. The bottom of upper cylinder is 5 ft. below platform, 1¼ in. connecting and ¾ in. discharge pipe 16 00

No. 239—With 2¾x13 inch brass lower cylinder, capped inside or outside..... 18 00

No. 239—With 2¾x18 inch brass lower cylinder, capped inside or outside..... 19 50

No. 239—With 2¾x18 inch bored iron lower cylinder, capped inside ..... 19 00

N. B.—Nos. 237, 236 and 239 pumps fitted with ¾ in. Martin patent 3 way cocks, as shown in Figure 25, at $3 each, added to above prices.

### EXTRA HEAVY PUMPS FOR WELLS OVER 100 FEET DEEP.

No. 234—2¾ inch porcelain lined lower cylinder. The bottom of upper cylinder is 5 ft. below platform, 1¼ connecting and 1 in. discharge pipe... 18 00

No. 234—With 2¾x13 inch brass lower cylinder, Capped inside or outside..... 20 00

No. 234—With 2¾x18 inch brass lower cylinder, capped inside or outside..... 21 50

No. 234—With 2¾x18 inch bored iron lower cylinder, capped inside..... 21 00

N. B.—No. 234 fitted with Martin's patent 3-way cock, at $3 each, added to above prices.

WIND MILL DEEP WELL PUMP.

Showing 3-way cock attached

FIGURE 25.

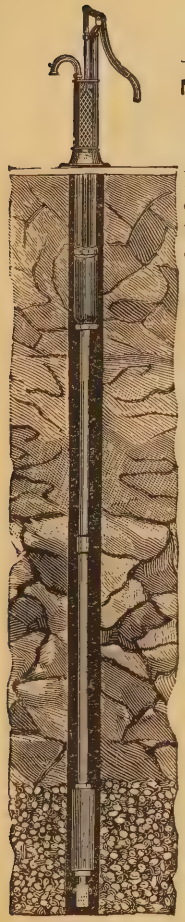


Figure 33.

### Method of Setting Buckeye Pumps in Drilled or Bored Wells.

Figure 33 represents our Buckeye Force Pump in a bored or drilled well, with the casing extending upward to the surface of the ground and the platform placed on top of the casing.

See that all rods and pipe are perfectly straight and that the lower cylinder is in working order.

Measure the well accurately and deduct 8¼ feet from the depth of the well, which will give the exact amount of pipe to use. Take random lengths of pipe equal to that distance, laying it out in line on the ground so as to measure it accurately, allowing for the threads that will be used in screwing together. Cut connecting rods of such length that each joint will come just above the upper end of each length of pipe—having the entire length of the rod just twelve inches less than the entire length of the pipe when all the joints are screwed tightly together, the ends of the rod uniting in the couplings.

Then finish putting in pump as described for setting Deep Well Pump.

### Buckeye Force Pumps for Cased Wells.

The rapidly increased use of well drilling machines, drilling holes of from 3 to 6 inches in diameter, in various sections of the country, has created a demand for a pump that would be suitable for such wells. Friends of the Buckeye have often solicited us to make a pump especially for drilled wells that would combine all the valuable features of the Buckeye.

Yielding to these solicitations, we have the pleasure of presenting to our customers and those having drilled wells, the Buckeye Force Pump for Drilled and Cased Wells. Thousands have been made since 1885 and in all cases have given perfect satisfaction to those who have used them. As will be seen by the illustrations it is so arranged that the upper cylinder and pipes connecting same to the pump head will enter into and pass down the casing as far up as the base of the pump. By this manner of construction we avoid cutting off the casing, and by having a tight platform fitting on top of the casing of the well, all surface water, toads, mice and other vermin are kept out of the well, and the water is absolutely pure.

### Sectional View of Working Parts of Buckeye Force Pumps for Cased Wells.

Fig. 36 is a sectional view of the Buckeye Force Pump for Drilled and Cased Wells, showing its interior working parts and their mode of operation. It is constructed with a lower cylinder of either enameled iron or brass, as preferred, and an upper cylinder or casing having suspended within it a brass cylinder whose area or capacity is exactly ½ of the lower cylinder. The upper casing or shell is connected to the lower cylinder by 1¼ inch pipe, and the force bucket or plunger in the suspended brass cylinder to the suction bucket or plunger in the lower cylinder by a ⅜ inch iron rod. It will be seen by this construction that the outlet for the water is directly upward to the spout, making altogether a double-acting force pump of the largest possible capacity that can be used in wells of this character. No other pump has all advantages for small cased wells that the Buckeye has.

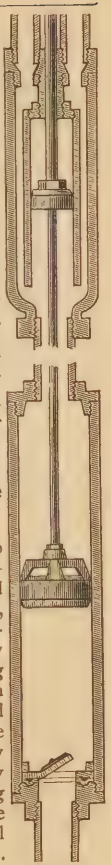


Figure 36.

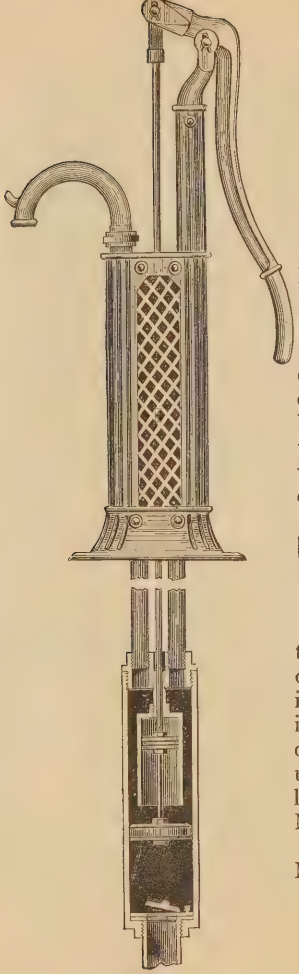


Figure 37.

## Buckeye Casing Pump for Shallow Wells.

Represented by Figure 37.

FOR WELLS UNDER 26 FEET DEEP.

No. 401—3 in. enameled cylinder, capped inside, 5½ ft. below platform, 1¼ inch suction and ¾ inch discharge pipe..... $15 00

No. 401—3 inch brass cylinder, capped inside, 5½ feet below platform, 1¼ inch suction and ¾ inch discharge pipe..... 16 00

We do not make any of our casing pumps with 3-way cocks, as in all cases where a 3-way cock is used in a cased well it is necessary to cut away the casing 5 feet below the platform, and curb the well from that point to the platform, and in that case we use our regular deep well heads with 3-way cock and inside capped lower cylinder.

## Buckeye Casing Pump, with 9 inch Stroke.

Represented by Figure 38.

FOR DEEP OR SHALLOW WELLS.

Especially designed to secure the largest amount of water in a given length of time from a cylinder of medium or small diameter, by increasing the length of stroke to 9 inches and providing suitable leverage in the handle. It increases the capacity of the pump nearly one-half and overcomes the objections to the use of small cylinders as used in casing wells. The lower part of this pump is illustrated in Fig. 36 on preceding page.

No. 435—2½x18 inch enameled lower cylinder, capped inside..... $17 50

No. 435—2½x18 inch brass lower cylinder, capped inside..... 19 50

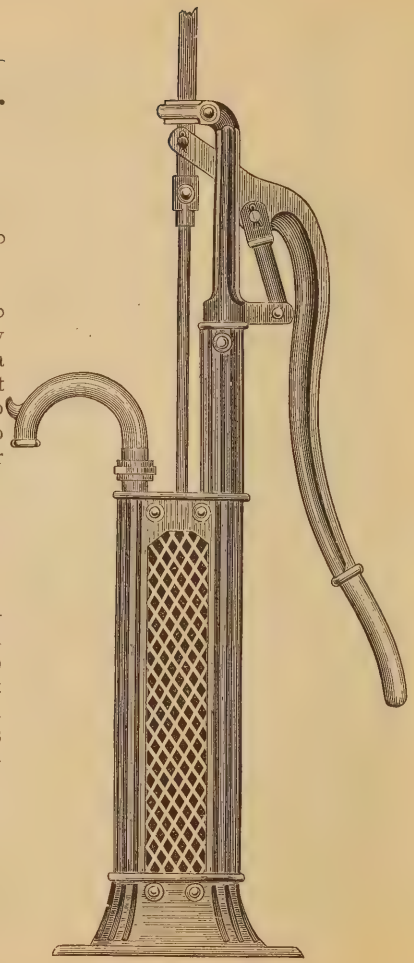


Figure 38.

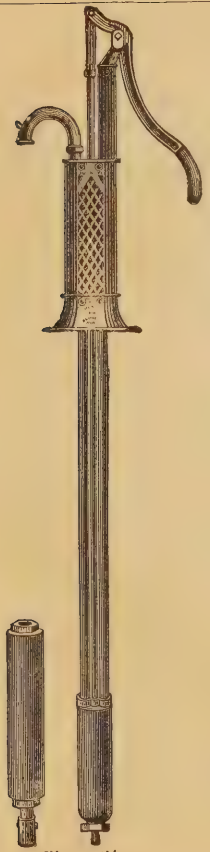


Figure 34.

PRICE LIST

—OF—

# Buckeye Force Pumps for Cased or Bored Wells.

## FOR HAND USE.

**FOR 4 INCH AND LARGER DRILLED WELLS, FROM 30 TO 50 FEET DEEP.**

No. 415—3 inch porcelain lined lower cylinder, capped inside..... $15 00
No. 415—With 3x13 inch brass cylinder, capped inside..... 17 00
No. 415—With 3x18 inch brass cylinder, capped inside..... 18 50

**FOR 3½ INCH AND LARGER DRILLED WELLS, FROM 50 TO 70 FEET DEEP.**

No. 418—2½ inch porcelain lined lower cylinder, capped inside..... 15 00
No. 418—With 2½x13 inch brass lower cylinder, capped inside..... 17 00
No. 418—With 2½x18 inch brass lower cylinder, capped inside..... 18 50

**FOR 3 INCH AND LARGER DRILLED WELLS. OVER 80 FEET DEEP.**

No. 417—2¼ inch porcelain lined lower cylinder, capped inside..... 15 00
No. 417—With 2¼x13 inch brass cylinder, capped inside..... 17 00
No. 417—With 2¼x18 inch brass cylinder, capped inside..... 18 50

## WITH WIND ENGINE TOPS.

**FOR 4 INCH AND LARGER DRILLED WELLS, FROM 30 TO 50 FEET DEEP.**

No. 437—3 inch porcelain lined lower cylinder, capped inside..... 16 00
No. 437—With 3x13 inch brass cylinder, capped inside..... 18 00
No. 437—With 3x18 inch brass cylinder, capped inside..... 19 50

**FOR 3½ INCH AND LARGER DRILLED WELLS, FROM 30 TO 70 FEET DEEP.**

No. 436—2½ inch porcelain lined lower cylinder, capped inside..... 16 00
No. 436—With 2½x13 inch brass cylinder, capped inside..... 18 00
No. 436—With 2½x18 inch brass cylinder, capped inside..... 19 50

**FOR 3 INCH AND LARGER DRILLED WELLS, FROM 30 TO 150 FEET DEEP.**

No. 439—2¼ inch porcelain lined lower cylinder, capped inside..... 16 00
No. 439—With 2¼x13 inch brass cylinder, capped inside..... 18 00
No. 439—With 2¼x18 inch brass cylinder, capped inside..... 19 50

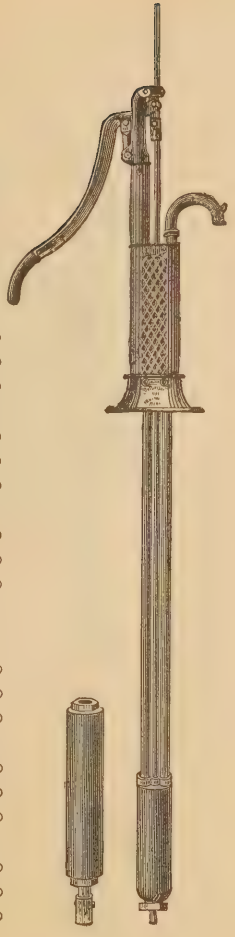


Figure 35.

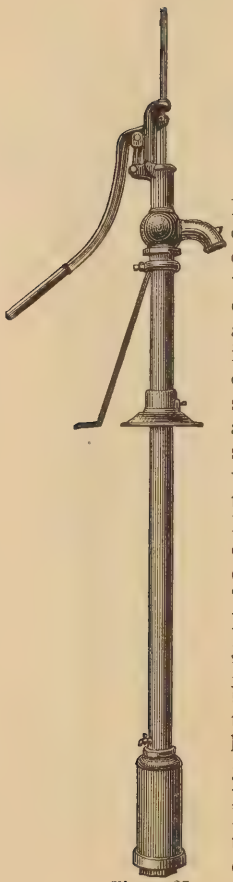


Figure 27.

NEW STYLE

# Buckeye Lift Pumps.

Figure 27 represents our New Style Buckeye Lift Pump. As shown by the cut they are for wells not over 26 feet deep, but by lengthening the pipe between the base and the cylinder, they can be used in deeper wells. They are admirably adapted for large stock farms, irrigation, etc., where large quantities of water are wanted to be raised from shallow wells to the surface only. They are very strong, the standard from the spout to the cylinder being one piece of wrought iron pipe. The base is fastened to the pipe by set screws, and with the Brace Collar and Brace, can be lowered on the pipe standard, raising the spout of the pump to any required height. The No. 298, 3 in.; No. 300, 3½ in.; No. 302, 4 in.; No. 304, 5 in., and No. 306, 6 in. Cylinder Pumps have Wind Mill Tops for use with wind engines, but are also provided with handles so that they can be used equally well by hand. The No. 320, 3 in. and No. 322, 3½ in. and No. 324, 4 in., are hand pumps only and not intended for Wind Mill use. They are similar in construction to the Wind Mill Pump, the only difference being in the top.

# PRICE LIST

—OF—

# New Style Buckeye Lift Pumps

**FOR HAND USE ONLY.**

No. 320—3 inch enameled cylinder, 5½ feet below platform, 1¼ inch suction pipe..... $10 00

No. 322—3½ inch enameled cylidder, 5½ feet below platform, 1½ inch suction pipe..... 11 00

No. 324—4 inch enameled cylinder, 5½ feet below platform, 2 inch suction pipe..... 13 00

**FOR WIND MILL OR HAND USE.**

No. 298—3 inch enameled cylinder, 5½ feet below platform, 1¼ inch suction pipe..... 10 50

No. 300—3½ inch enameled cylinder, 5½ feet below platform, 1½ inch suction pipe..... 11 50

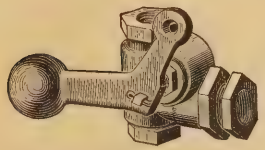
No. 302—4 inch enameled cylinder, 5½ feet below plalform, 2 inch suction pipe..... 13 50

No. 304—6 inch enameled cylinder, 5½ feet below platform, 2½ inch suction pipe..... 17 50

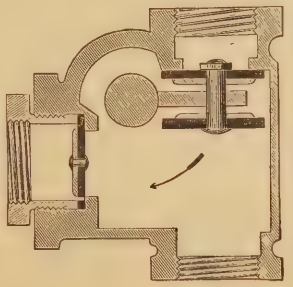
No. 306—6 inch enameled cylinder, 5½ feet below platform, 3 inch suction pipe..... 20 00

All Pumps are provided with a small cock in the pipe, just above the cylinder, which may be opened in winter to prevent freezing.

## MARTIN'S PATENT 3-WAY COCK.

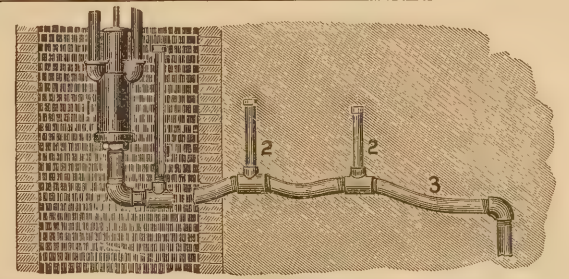


This cut represents our new 3-way cock, invented and patented by our Superintendent, Mr. S. W. Martin, with a view to overcome the objections to, and imperfections in the old style brass cock, with its stem fitted to each cock and not interchangable when worn out by use or damaged by carelessness. It is shown in the pump by Figs. 21, 23 & 25. The iron rod connected to it and extending above the base of pump should always be moved up or down to change the course of water *by hand* and *never jammed down with the feet.* The valves are made of brass, with leathers fitted against a turned seat, and work perfectly easy. With proper care the cock will last for years.



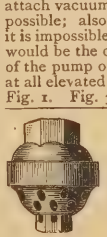
This cut shows a sectional view of the 3-way cock. The water enters the opening from the discharge pipe, and is forced through upper opening through the pipes and out of the spout of pump, or by pushing down the lever the course of the water is changed and it is forced through the side opening through conducting pipes which may be laid under ground to any point to deliver water into an elevated tank or into the house, barn or stock yards direct as may be desired. A small check valve is placed in the side opening to prevent the pressure of water on the valves of pump, when a long conducting pipe is used. Always use a union in the conducting pipe near the 3-way cock so that in case the pump has to be taken up for any cause, it can be detached without digging up the conducting pipe. It is made in three sizes and can be used on all pumps except the Casing Pump.

| | |
|---|---|
| ¾ inch for 2¼, 2½ and 3 inch cylinder pump | $3 00 |
| 1 inch for 3½ and 4 inch cylinder pump | 3 50 |
| 1¼ inch for 5 inch cylinder pump | 5 00 |



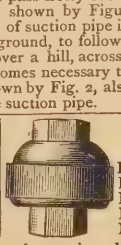

**Directions for Setting Shallow Well Buckeye Pumps to Draw Water a Long Horizontal Distance.**

If there be an ascent from the spring or well to the point where it is desired to locate the pump, lay the suction pipe in trench by aid of a spirit level so that each point on the line from the spring to the pump will be higher as you approach the pump than any preceding point, so the air in the suction pipe can pass freely out through the pump. Then attach vacuum chamber to the suction pipe as shown by Figure 1, as near the pump as possible; also use a strainer foot valve on end of suction pipe in spring or well. Where it is impossible, owing to the contour of the ground, to follow the above directions—as would be the case in passing from the spring over a hill, across a valley, to the location of the pump on another elevation—it then becomes necessary to erect on the suction pipe at all elevated points vacuum chambers as shown by Fig. 2, also using vacuum chamber Fig. 1. Fig. 3 in the above cut represents the suction pipe.



**Strainer Foot Valves.**

| | |
|---|---|
| For 1 inch pipe | $1 25 |
| For 1¼ inch pipe | 1 50 |
| For 1½ inch pipe | 1 75 |
| For 2 inch pipe | 2 00 |
| For 2½ inch pipe | 2 25 |



**Check Valves.**

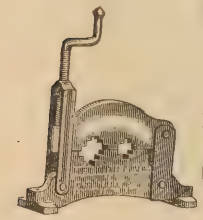
| | |
|---|---|
| For 1 inch pipe | $1 50 |
| For 1¼ inch pipe | 1 75 |
| For 1½ inch pipe | 2 00 |
| For 2 inch pipe | 2 25 |
| For 2½ inch pipe | 2 50 |

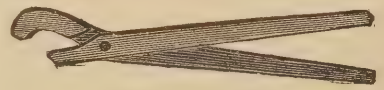
In all cases where it is desired to draw water by suction a long horizontal distance or to near the practical limit of elevation always use a check valve or strainer foot valve on the end of suction pipe in well.

## PRICE LIST OF PUMP TOOLS.

Clark's Ratchet Stock, with lead screws and bushing.....$ 9 50
½, ¾, 1, 1¼ inch Solid Dies, each $2.50..... 10 00
1½ inch Solid Die..... 3 00

Price complete..... $22 50





### COMMON PIPE TONGS.

| ½ | ¾ | 1 | 1¼ | 1½ | 2 in. | ⅜ Rod. |
|---|---|---|---|---|---|---|
| .75 | $1.00 | $1.15 | $1.40 | $1.75 | $2.00 | $1.00. |

### CLARK'S PIPE VISE.

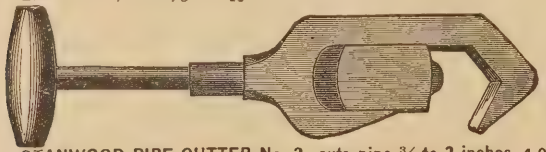
½ to 1½ in. Pipe, $3.00.

### BROWN'S PAT. ADJUSTABLE PIPE TONGS

No. 2 takes pipe from ½ to 1¼ inch.....$2 00
No. 3 takes pipe from 1 to 2 inch..... 2 75
No. 4 takes pipe from 1½ to 3 inch..... 4 50

### STOCK AND DIES FOR THREADING PUMP ROD.

Mal. plate, with ⅜ and ⅞ dies.....$4 50
Bit Brace collet, with ⅜ and ⅞ dies..... 4 25



### STANWOOD PIPE CUTTER No. 2, cuts pipe ¾ to 2 inches. 4.00

### ROUSE PATENT PIPE WRENCH.

14 inch....$3.00 | 18 inch....$4.00 | 24 inch....$6 00

## 5½ FEET HYDRANTS.

Fitted complete, as shown in cut, for Garden, Lawn, House and Barn use.

For ¾ inch pipe.....$3 50
For 1 inch pipe..... 4 50
For 1¼ inch pipe..... 7 00

## GLOBE AND ANGLE VALVES.

| Size, Inches | ½ | ¾ | 1 | 1¼ | 1½ | 2 |
|---|---|---|---|---|---|---|
| Price, Each | 95 | $1 35 | $1 75 | $2 65 | $3 60 | $5 60 |

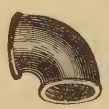
## BRASS COCKS

| Size, Inches | ½ | ¾ | 1 | 1¼ | 1½ | 2 |
|---|---|---|---|---|---|---|
| ROUGH STOPS. | | | | | | |
| T or Lever Handle | $1 15 | $1 75 | $2 50 | $3 75 | $5 50 | $ 8 50 |
| T or Lever Check and Waste | 1 25 | 1 90 | 2 70 | 4 00 | 6 00 | 9 50 |
| HYDRANT COCKS. | | | | | | |
| T Handle Check and Waste | 1 40 | 2 10 | 3 00 | 5 00 | | |
| BIBB COCKS. | | | | | | |
| Lever Handle, rough | 1 25 | 1 80 | 2 50 | 4 10 | 7 15 | 13 00 |
| Lever Handle, finished | 1 35 | 2 00 | 2 85 | 4 50 | 7 75 | 14 00 |
| For Hose, Lever Handle, rough | 1 35 | 2 00 | 2 85 | 4 50 | 7 75 | 14 00 |
| For Hose, Lever Handle, finished | 1 45 | 2 20 | 3 20 | 4 90 | 8 35 | 15 00 |
| COMPRESSION BIBB COCKS. | | | | | | |
| T Handle, rough | 1 00 | 1 70 | 3 00 | | | |
| T Handle, finished | 1 10 | 1 90 | 3 35 | | | |
| For Hose, T Handle, rough | 1 10 | 1 90 | 3 35 | | | |
| For Hose, T Handle, finished | 1 20 | 2 10 | 3 70 | | | |

## PIPE FITTINGS—Send for Special List on Fittings.

LOCK NUT.

BUSHING.


ELBOW.

CROSS.

REDUCER.

TEE.

RETURN BEND.

NIPPLE.

UNION.

COUPLING.

CAP.

FLANGE UNION.

# PUMP TRIMMINGS.

## BUCKEYE RUBBER HOES.

| | |
|---|---|
| ¾ inch 3-ply Buckeye Standard Rubber Hose, per ft. | $ 30 |
| 1 inch 3-ply Buckeye Standard Rubber Hose, per ft. | 40 |
| 1¼ inch 3-ply Buckeye Standard Rubber Hose, per ft. | 50 |

## BRASS HOSE COUPLINGS.

| | |
|---|---|
| ¾ Brass Hose Couplings, per pair | 40 |
| 1 Brass Hose Couplings, per pair | 60 |
| 1¼ Brass Hose Couplings, per pair | 1 25 |

## BRASS HOSE NOZZLES.

| | |
|---|---|
| Plain Brass Nozzle for ¾ inch Hose | 1 00 |
| Plain Brass Nozzle for 1 inch Hose | 1 25 |
| Brass Screw Tip Nozzle for ¾ inch Hose | 1 25 |
| Brass Screw Tip Nozzle for 1 inch Hose | 1 50 |
| Brass Screw Tip Nozzle for 1¼ inch Hose | 4 00 |
| Sprinkler for Brass Screw Tip Nozzle for ¾ inch Hose | 50 |
| Sprinkler for Brass Screw Tip Nozzle for 1 inch Hose | 50 |

## BUCKEYE ENAMELED HOSE NOZZLE.

| | |
|---|---|
| No. 1 Enameled Iron Buckeye Nozzle for ¾ inch Hose | 30 |
| No. 2 Enameled Iron Buckeye Nozzle for 1 inch Hose | 35 |
| No. 3 Enameled Iron Buckeye Nozzle for 1¼ inch Hose | 42 |
| No. 7 Enameled Iron Buckeye Nozzle and Sprinkler for ¾ inch Hose | 50 |
| No. 8 Enameled Iron Buckeye Nozzle and Sprinkler for 1 inch Hose | 56 |
| No. 9 Enameled Iron Buckeye Nozzle and Sprinkler for 1¼ inch Hose | 63 |

## FIVE FOOT HOSE AND NOZZLE.

| | |
|---|---|
| 5 ft. ¾ in. Hose with No 7 Enameled Nozzle and Sprinkler | 2 00 |
| 5 ft. 1 in. Hose with No. 8 Enameled Nozzle and Sprinkler | 2 50 |
| 5 ft. 1¼ in. Hose with No. 9 Enameled Nozzle and Sprinkler | 3 00 |
| 5 ft. ¾ inch Hose with Plain Brass Nozzle fitted | 2 50 |
| 5 ft. 1 inch Hose with Plain Brass Nozzle fitted | 3 25 |
| 5 ft. 1¼ inch Hose with Plain Brass Nozzle fitted | 6 50 |
| 5 ft. ¾ inch Hose with Screw Tip Nozzle and Sprinkler | 3 25 |
| 5 ft. 1 inch Hose with Screw Tip Nozzle and Sprinkler | 4 00 |

## PUMP ROD AND ROD COUPLINGS.

| | |
|---|---|
| 7/16 inch Plain Rod Couplings, threaded, each | 4 |
| 7/16 inch Galvanized Rod Couplings, threaded, each | 6 |
| 7/16 inch Plain Rod and Couplings, threaded, per foot | 6 |
| 7/16 inch Galvanized Rod and Couplings, threaded, per foot | 7 |
| ⅜ inch Galvanized Couplings, threaded, each | 0 |
| ⅜ inch Galvanized Steel Rod and Couplings, threaded, per ft. | 8 |
| ⅜ inch Galvanized Steel Rod, not threaded, per foot | 7 |

# PUMP CYLINDERS.

### BRASS UPPER—Complete.

| | |
|---|---|
| No. 6x. For 2¼ inch pump | $ 2 75 |
| No. 2x. For 2½ inch pump | 2 92 |
| No. 4x. For 3 inch pump | 3 10 |
| No. 8. For 3½ inch pump | 3 45 |
| No. 11. For 4 inch pump | 4 50 |
| No. 13. For 5 inch pump | 6 00 |
| No. 17. For 2¼ inch pump, 1 inch pipes | 3 00 |

### ENAMELED LOWER—Complete.

| | |
|---|---|
| No. 7. For 2¼ inch pump, outside cap | 4 50 |
| No. 3. For 2½ inch pump, outside cap | 4 50 |
| No. 5. For 3 inch pump, outside cap | 4 50 |
| No. 10. For 3½ inch pump, outside cap | 5 50 |
| No. 12. For 4 inch pump, outside cap | 7 00 |
| No. 14. For 5 inch pump, outside cap | 9 00 |
| No 16. For 6 inch pump, outside cap | 12 00 |
| No. 7x. For 2¼ inch pump, inside cap | 4 50 |
| No. 3x. For 2½ inch pump, inside cap | 4 50 |
| No. 5x. For 3 inch pump, inside cap | 4 50 |

### BRASS LOWER—Complete.

| | |
|---|---|
| 2¼x13 inch, outside or inside cap | 8 00 |
| 2½x13 inch, outside or inside cap | 8 50 |
| 3 x13 inch, outside or inside cap | 9 00 |
| 3½x13 inch, outside or inside cap | 10 00 |
| 2¼x18 inch, outside or inside cap | 10 00 |
| 2½x18 inch, outside or inside cap | 10 50 |
| 3 x18 inch, outside or inside cap | 11 00 |

### ENAMELED DOUBLE—Complete.

| | | | |
|---|---|---|---|
| 3 inch, complete | $5 75 | 4 inch, complete | 7 45 |
| 3½ inch, complete | 6 60 | 5 inch, complete | 10 50 |

### FOR CASING PUMPS—Complete.

| | |
|---|---|
| No. 7x. 2¼ inch, lower enameled | 4 50 |
| No. 20. 2½x18 inch, lower enameled | 4 50 |
| No. 18. 3 x18 inch, lower enameled | 4 50 |
| No. 21. Iron upper shell for 2¼ pump, complete | 3 50 |
| No. 21. Iron upper shell for 2½ pump, complete | 3 75 |
| No. 19. Iron upper shell for 3 pump, complete | 4 25 |

# RADIAL CENTER BRASS JACKET DRIVE WELL POINTS.

This cut shows the Malleable Radial Center.

This cut shows the Radial Center wound with heavy galvanized wire, ready for putting on the wire gauze and Brass Jacket.

This cut shows the Drive Point complete with wire gauze and Brass Jacket.
This is an entirely new method of constructing Drive Well Points, which leaves nearly the entire surface under the wire gauze open for admission of water.

## LATEST REVISED PRICE LIST OF

### BUTT WELDED WROUGHT IRON PIPE.

| SIZE. | Price per Foot | Price per Foot | Weight per 100 ft. |
|---|---|---|---|
| INCHES. | BLACK. | GALVANIZED. | POUNDS. |
| ¼ | .04 | .05 | 42 |
| ⅜ | .04 | .05½ | 56 |
| ½ | .05 | .07 | 84 |
| ¾ | .07 | .09 | 112 |
| 1 | .09½ | .12½ | 167 |
| 1¼ | .12½ | .17 | 224 |

Discount on 1¼ in. and smaller { Black....per cent / Galv.....per cent

### LAP WELDED WROUGHT IRON PIPE.

| SIZE. | Price per Foot | Price per Foot | Weight per 100 ft. |
|---|---|---|---|
| INCHES. | BLACK. | GALVANIZED. | POUNDS. |
| 1½ | .22 | .25 | 268 |
| 2 | .28 | .32 | 361 |
| 2½ | .44 | .49 | 578 |
| 3 | .58 | .64 | 754 |
| 3½ | .70 | .86 | 900 |
| 4 | .85 | 1.00 | 1066 |

Discount on 1½ inch and larger. { Black....per cent / Galv.....per cent

☞All manufacturers have adopted this as the standard list of Gas Pipe. All previous quotations are hereby withdrawn. We will be pleased to make you discounts on application, and think you will find our prices as low as manufacturers will make you.

## REVISED PRICE LIST —OF— RADIAL CENTER DRIVE WELL POINTS

| Length. | Length of Jacket. | WIRE GAUZE. No. 60 | No. 80 | No. 90 | No. 100 |
|---|---|---|---|---|---|
| **1 INCH POINTS.** | | | | | |
| 2 feet. | 18 inches. | $2 75 | $3 33 | $3 75 | $4 00 |
| 3 feet. | 18 inches. | 4 17 | 5 17 | 6 00 | 6 50 |
| **1¼ INCH POINTS.** | | | | | |
| 20 inches | 14 inches. | $2 50 | $3 00 | $3 50 | $4 00 |
| 2 feet. | 18 inches. | 3 00 | 3 75 | 4 33 | 4 83 |
| 2½ feet. | 24 inches. | 3 75 | 4 67 | 5 33 | 5 83 |
| **1½ INCH POINTS.** | | | | | |
| 2 feet. | 18 inches. | $4 00 | $4 83 | $5 50 | $6 00 |
| 2½ feet. | 24 inches. | 4 75 | 5 83 | 6 67 | 7 17 |
| 3 feet. | 30 inches. | 5 50 | 6 83 | 7 83 | 8 50 |
| **2 INCH POINTS.** | | | | | |
| 2 feet. | 18 inches. | $6 25 | $ 8 33 | $ 8 17 | $ 8 67 |
| 2½ feet. | 24 inches. | 7 50 | 9 00 | 9 58 | 10 50 |
| 3 feet. | 30 inches. | 8 50 | 10 00 | 11 67 | 12 50 |
| **2½ INCH POINTS.** | | | | | |
| 4 feet. | 36 inches. | $14 17 | $15 50 | $17 17 | $18 83 |
| **3 INCH POINTS.** | | | | | |
| 4 feet. | 36 inches. | $15 50 | $17 00 | $18 75 | $20 67 |

When it is necessary to drive in very fine quicksand, use the Radial Center Points, covered with either No. 90 or No. 100 wire gauze, which very seldom fails to keep out the finest sand.

While it costs a little more to make Radial Center Points than same size pipe points, you get a point with more than four times as much water surface under the gauze as you can get in any pipe point made, and this fact makes Radial Center Points the cheapest to buy of any point in the market.

FOR PRICE OF FIRE PUMP SEE PAGE 9.

# Fire or Village Pump.

This pump is a heavy substantial pump constructed to meet the demands of villages and factories for fire protection. It has a 5 inch double acting cylinder and 2½ inch suction pipe. The spout is threaded for 1¼ inch hose connection. It is provided with two iron handles each about four feet long, so that from two to six men can use it in case of necessity. It can also be used for ordinary purposes as it works easily when hose is not attached. As the cylinder and working parts are all placed below frost, it is always primed and ready for use no matter how long it may have remained idle. In many places fire insurance companies have reduced the rate on insurance where these pumps have been placed in use, as they realize the advantage of having a reliable water supply that can be handled to advantage by the first parties on the ground.

THE BUCKEYE FORCE PUMP IN USE.

# MAST, FOOS & CO.,

SPRINGFIELD, OHIO,

U. S. A,

MANUFACTURERS OF

# Iron Turbine Wind Engines,

BUCKEYE FORCE PUMPS,

BUCKEYE IRON FENCE,

Buckeye Senior and Junior Lawn Mowers, Etc.

# THE IRON TURBINE WIND ENGINE.

TO those who feel the need of some power other than that of hand or horse power for raising water for stock, irrigation and domestic use, the first question that suggests itself is, what shall I use, and how much will it cost? The object of this circular is to furnish such information on the subject as will, we think, be of service to the many thousand farmers and others who would gladly avail themselves of some comparatively inexpensive power if they had facilities for computing the cost and determining the practicability. The use of Wind as a Motive Power has been discussed in all its bearings by Scientific and Agricultural Journals, thousands of wind mills are in successful operation, and it would be a waste of time for us to present an argument in favor of their general use, as every intelligent man now recognizes their value. The greatest objections to wind mills have been their liability to blow down in violent storms, their short life, (ordinary wear and tear rendering them useless in from two to five years on an average,) and the insufficient quantity of water furnished during the calm months, owing to their slow motion in a light wind. In the Iron Turbine we have completely overcome the objections named, and profiting by the experience of others, and by our own practical knowledge of mechanics, obtained through twenty years' experience in the manufacture of Agricultural Implements, we have produced a wind engine *free* from the defects which make *so many* wind mills worthless. Since wind mills were first brought into practical use as a labor saving machine, we can safely say that *no* wind mill ever attained as honorable reputation or became so *deservedly* popular in the same length of time as the Iron Turbine It has been successfully introduced in every State and Territory of the United States, as well as in England, France, Germany, Russia, Australia, New Zealand, Sandwich Islands, and other foreign countries, and is the strongest, most durable and powerful wind mill in the world. The Turbine has taken over 300 first premiums at State and county fairs, in competition with the leading wind mills in the country.

Hundreds of them are now in operation throughout the country and are giving *complete* satisfaction. We give a written warranty with each mill and respectfully invite all parties who propose putting up a wind mill to give us a call before making a selection, as we can prove beyond a doubt that we have the best.

## VALUE OF WATER FOR STOCK.

Stock should have access to water at all times, especially cows that give milk. They want to drink often and return to their feed. The best stable, and one in which stock do the best, is one where water is always running in through troughs before the cattle. Thus managed, cows may be kept up to a full flow of milk, either winter or summer. If the pasture fails from drouth, it may be supplanted with other feed, but a failure of water cannot be remedied. So in winter, cows that are watered only once a day, as many do who consider themselves good farmers, shrink in their milk and it can never be regained. The same rule will hold good in the stable;

abundant food may be supplied, but if the water supply fails the profit will be *nil.* The necessity of pure water for stock is one of the first importance to breeders and feeders. It must not only be in abundance but it should be in such supply that stock may either take it at will, or if supplied at stated times it should be offered at least twice a day, and three times will be better. No animal can thrive properly that has access to water but once a day. Every good feeder knows this and hence, in all large feeding establishments, the greatest care is taken to keep the supply ample and constant. Many farmers neglect this and always to their cost. If water cannot be had near, in any other way, wells should be dug, and water raised by an Iron Turbine Wind Engine and Buckeye Pump, so that the stock get it as regularly as they feed. It will pay. Remember that animals should be treated well in order to thrive properly. We are familiar with troubles incident to the neglect of regularity in food and drink with the human body and the consequences are somewhat analogous to our cattle.

## IN THE DAIRY DEPARTMENT.

Wind engines are indispensable to furnish cold well water for the milk room, as ice is often inaccessible and always expensive. Cold well water is found to best meet all the requirements of the dairy interest; it is of the right temperature, and is kept fresh and pure by constant renewal. Its ebb and flow is also favorable to carry off the animal heat, hence the value of the cold water system.

Here again wind engines have met the water problem, making it possible for every farmer to have a living spring at his door and under his control. The prairies of the West are rapidly becoming dairy farms by virtue of the new enterprises created for them by wind power, increasing their productiveness and value.

## FOR HOUSEHOLD PURPOSES.

Most of the farm houses are supplied with water from wells, and many of them very deep ones. Those who are familiar with the constant demand for water for washing, cleansing, cooking and other household purposes, know the labor it requires to pump the water necessary, and that labor often done by the already overburdened housewife. Generally by a very little additional expense the stock wind engine is made to supply all the needs of the household with an abundance of fresh water, and so arranged as to store up water in tanks, and from thence drawn with faucets for house use, or with hose for watering flowers, sprinkling lawns, washing carriages and running fountain jets, etc. To supply suburban residences, hotels, watering places, seminaries, charitable and public institutions, with cool, fresh, pure and sparkling water the wind engine is especially adapted, bringing the luxury of City Water Works to the home of any one at a much smaller cost than paid by consumers in the city.

## FACTS WORTHY OF ATTENTION.

The superior points of the Iron Turbine are easily comprehended. The entire machine is made of iron. The Wheel and Vane are made of No. 24 sheet iron, well bound and braced with the best quality of wrought bar iron, and so well put together that it is impossible for the wind to tear them to pieces or injure them in any way. The wheel being constructed on the Turbine principle causes it to give more power than any other wheel of the same diameter in the market, and as there is no wood about it to swell, shrink, rattle and be torn to pieces by the wind, it is certainly much more durable. It has a perfect automatic governor, by means of which it regulates itself in high winds or gales, and is provided with a brake to hold wheel perfectly still when out of wind. It runs in a

light wind when all other mills remain still. It is noiseless in operation and graceful in appearance.

Special attention is paid to the construction of the machinery or engine proper, only the very best materials being used. Polished shafting and babbit-lined boxes with cavity between the bearings in which is placed packing to hold oil, to prevent the necessity of very frequent oiling. The pitman bearing is provided with a glass oiler that will hold a week's supply so it is necessary to oil only when you can see from the ground that the glass oiler is empty. We use a pitman with a hardened wrist-pin and adjustable brass boxes, so that all wear or slack may be easily taken up to keep the engine running smoothly and prevent knocking and unnecessary wear. The quality of workmanship is equal to the best steam engine. Experience has taught us that good, substantial work is appreciated, and though it costs more, it pays in the end both manufacturers and purchasers. We give our mills *three* coats of the best paint, and it will wear for years before it needs painting again. The wonderful success of last season has encouraged the manufacturers to make extensive preparations to meet the increasing demand, and hereafter we expect to fill all orders promptly. We will cheerfully furnish any information in regard to the use of the wind engine. Parties desiring estimates will please state plainly by letter what they want done, giving depth of well, the distance and elevation from well to place where the water is to be delivered, the number of gallons required per day, and if there are any buildings, trees or hills near where mill is to be placed, state height and distance. A rough sketch, showing position of well and derrick, tank, and all places where water is to be forced, will materially aid us in understanding what is wanted and in making an estimate. Do not buy any other Wind Engine until you have corresponded with us.

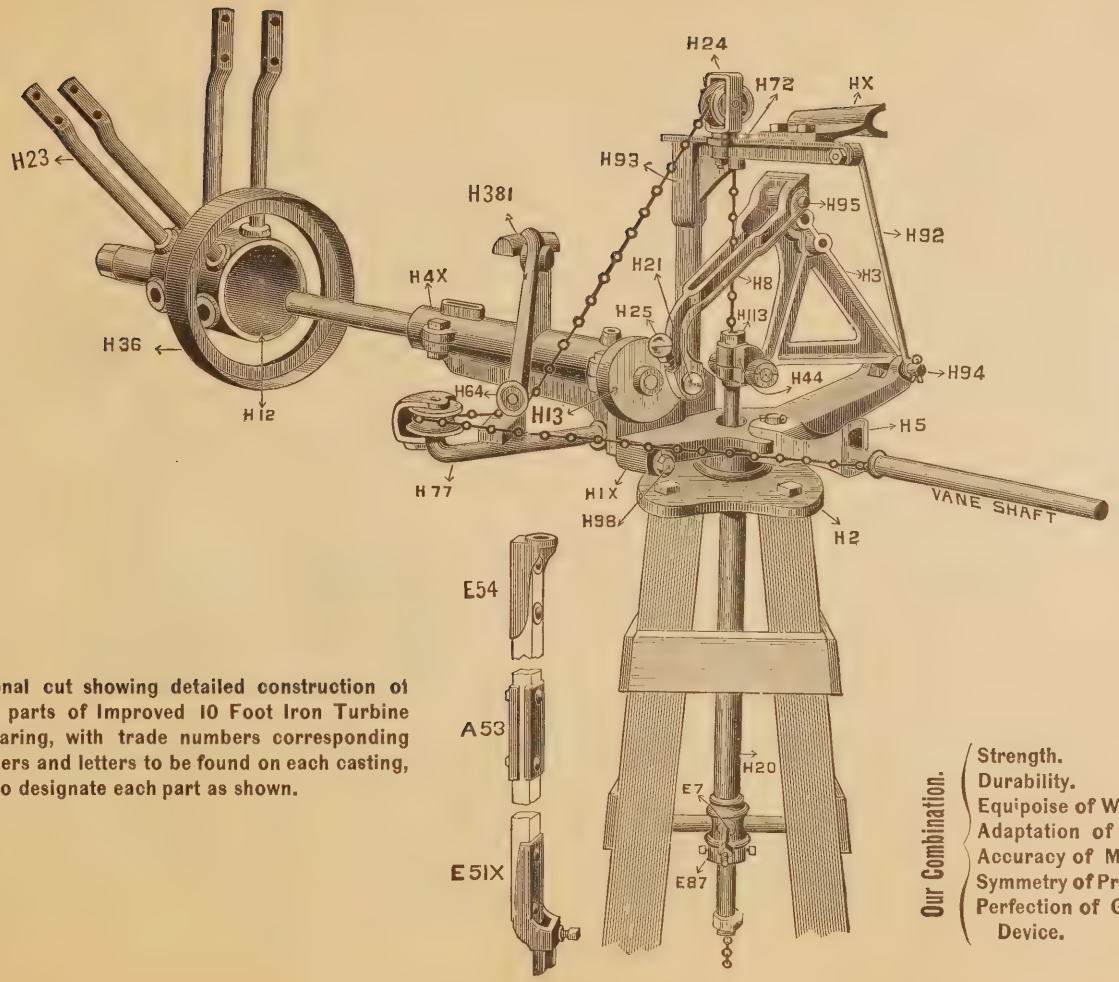
# PRACTICAL SUGGESTIONS.

## THE DERRICK

Must be of such a height that the wind will have a free and uninterrupted passage to the wheel, and the height is determined by surrounding buildings, trees and high hills. If such obstacles exist the wheel must be placed so that it will be at least ten feet above them. The larger number of derricks are too low. Many are erected where the wind is shut off from the wheel on one, two or three sides. Under such circumstances they are inoperative, and are also in great danger, for when storms occur they form by their surroundings the centers for squalls, whirlwinds and eddies, which are disastrous to them. The movement of the wind near the ground is of an undulating or wave character, and does not become steady and uniform for some feet above the surface. We therefore recommend that derricks should be at least 36 feet high. They should also be perfectly firm and well braced, so as not to be liable to blow down in storms or jar and tremble with every revolution of the wheel. Money is saved by erecting a good, strong, substantial derrick, following our directions carefully.

## PUMPS.

In selecting a pump for a wind engine the great point to be secured is the efficiency of the engine in a light wind. Any engine or mill will run in a heavy wind, but many fail in the light winds of summer because the pump is too large. A pump for a wind engine should always be smaller than for hand use. When pumping by hand *time* is of great value and the pump that will throw the greatest amount of water in the shortest time with the least amount of labor, is the most desirable. But with wind engines the case is different. Time




**Sectional cut showing detailed construction of individual parts of Improved 10 Foot Iron Turbine Engine gearing, with trade numbers corresponding with numbers and letters to be found on each casting, and used to designate each part as shown.**

**Our Combination.**

- **Strength.**
- **Durability.**
- **Equipoise of Weight.**
- **Adaptation of Parts.**
- **Accuracy of Movement.**
- **Symmetry of Proportion.**
- **Perfection of Governing Device.**

is nothing, as ordinarily an engine is not required to run over two to four hours a day to pump what water is needed. In the hot months of summer there are days at a time when there is very little wind, and an engine should have as light a load as possible, to guard against a failure of water at such times. A small pump, even though it requires twice the length of time to pump the required quantity of water, is the best. It will enable the engine to move more hours in the day, and in fact furnish more water than if a larger pump is used.

The Buckeye Pump (see pump catalogue) is admirably adapted for wind mills, working one-half of the water on the up and one-half on the down stroke of the engine, the friction of the water through the pipe is greatly reduced, a constant stream is kept up and the wear and tear of the engine lessened.

## PIPE.

It is very important that the suction pipe of the pump should be as designated in our list of pumps—larger, maybe, but smaller never—should be used. If the distance is long, or the elevation is great, the pipe from the 3-way cock to the tank or water trough should be of the same size as the suction pipe of the pump. The size of the distributing pipes from the storage tank depends entirely on the distance and fall.

## TANKS.

We furnish round, square and house tanks, and water troughs of all sizes and dimensions. It is advisable to have the storage tank at least three times the capacity of the daily consumption, in order to have a supply on still days when there is no wind We furnish estimates of best possible combination of engine, pumps, tanks, water troughs and pipe, on receipt of specifications of what is wanted. Hundreds of wind engines are failures solely from pumps being too large, pipes too small, and tanks having too small capacity.

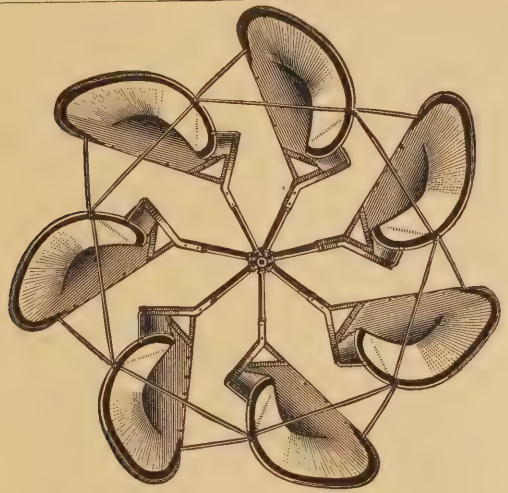
## THE ENGINE.

The cut on page 5 shows the engine or working parts of the Turbine, which, with the wheel and vane shown on following page, make the Iron Turbine Wind Engine complete, a detailed description of which will be found on page 7. Reference may be had to these cuts when erecting an engine, and it will be almost impossible to make a mistake. Only the best material is used in its construction, and the parts are all fitted and put together by competent and experienced workmen. Every part is fully warranted against defects in material or poor workmanship.

It is a conceded fact that our Iron Turbine Wheel will many times outlast an ordinary wooden wheel, exposed, as a wind wheel is, to all kinds of weather and high winds. And having this durability in the wheel, we construct our engine gearing with reference to securing equal durability in it.

## THE VANE.

Is made of heavy sheet iron thoroughly braced. The vane shaft is 1¼ inch gas pipe, and securely bolted to the vane. By referring to cut on page 5 the relative position of the vane to the engine gear will be seen. In addition to the vane shaft the vane is connected to the engine gear with a heavy brace rod terminating in a chain which passes around eccentric HX.



THE WHEEL.

The above cut shows Wheel braced ready for work. The buckets are tied together by the braces, making the whole wheel perfectly rigid, with no joints to rattle in the wind.

## DESCRIPTION.

The Iron Turbine Wind Engine is made entirely of Iron, and therefore is more durable than any other machine. The turbine shaped buckets are solid and smooth, losing nothing by friction, as is the case with rough wheels, and curved as they are, do not lose the resistance as soon as receiving the current of wind, but in accordance with a principle long since taught in philosophy, that a current of water following a curved surface in its descent, though much greater in actual distance than the gravitating curves, yet the former will reach a given horizontal plane in the same time of the latter; hence the wind does not lose its force upon the bucket in its first contact, but like a stream of water following the curve still using its momentum till its escape from the wheel. Then again a point on the circumference of a wheel in motion will pass twice as fast through space as a point only one-half the distance from the center to the circumference; so in a wind wheel in motion the outer end of the buckets or slats are receding from the action of the wind at a much greater rate of speed than the inner end, consequently affording much less resistance to the action of the wind than the inner ends. This apparent defect is overcome by making our buckets in a spiral shape so they will present a more obtuse angle to the wind as the outer end is approached, thereby equalizing the action of the wind over the entire surface. The buckets are firmly bolted to the flattened end of the iron pipe forming the spoke of the wheel, the other end being screwed into the hub. The buckets are laterally and diagonally braced to each other, the whole making a solid and substantial wheel. The wheel hub is fitted and secured to main shaft by set screws and bolts, thus preventing the wheel from ever turning on the shaft, and being made in the form of a drum it is projected back over the journal box of main shaft so as to bring the center of the weight of the wheel directly over the bearing of the journal box, doing away entirely with any tendency to sag or wear the main shaft out of line. The journal box of main shaft is 16 inches long and lined inside with babbitt metal, with a recess in the center for holding oil. The main shaft is made of cold rolled steel shafting made expressly for our use.

The pitman is connected with crank wheel on the main shaft

by an adjustable brass box, which is supplied with oil by a self-oiler. The motion is transferred from main shaft by the pitman and elbow, which almost entirely does away with side vibration in stroke of pump, and furnishes a very convenient arrangement for changing the length of stroke. The elbow is connected to the pump rod with adjustable bearings arranged to take up all lost motion caused by wear. The pump rod passes down through the turn table, and bed plate to wooden pump rod. The bed plate is bolted securely to the top of derrick, the stem of turn table passing down through the bed plate and fastened by collar and set screw, The wheel being placed 5½ inches off the center of turn-table, the extra pressure against the wheel during a storm forces or shifts it around parallel with the vane and out of the wind. The vane is hinged to turntable in a socket, and connected by a rod, to an eccentric, which in turn is connected to turn-table by an upright bar, and by its weight, with the leverage obtained by the peculiar arrangement of the eccentric, holds the wheel into wind, and when forced out of wind, by extra pressure brings it back into position, thus making the engine entirely self-regulating in time of storms, without the use of weights or regulating vane. The pull-out chain is attached to the vane shaft, passing through a pulley attached to turn-table, under pulley on brake lever up over pulley on eccentric and down through slot in the pitman and through the center of gas pipe to lever on derrick near the ground.

Many complaints have been made that most wind mills run equally well when out as when in wind. To obviate this difficulty the Turbine is provided with a brake, operated by the pull-out chain, which has proved, on trial, to be a complete success. A broad wheel is bolted to the spider, a lever is attached to the engine, having on one end a pad which acts on the brake wheel, and on the other a pulley, under which the chain passes, which effectually prevents any revolution or rocking of the wheel when pulled out of wind.

## 36 FOOT DERRICK.

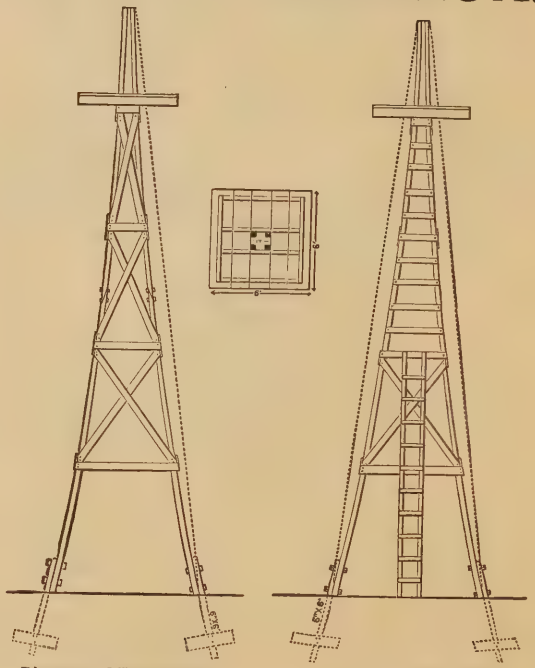


**Diagram of Three Sides.** **Diagram of Ladder Side.**

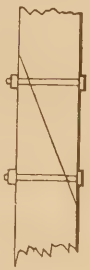
## List of Materials for 36 foot Derrick for 8½ and 10 foot Engines.

8 Pieces, 4x4, 18 or 20 feet long, for Main Post.
1 Piece 2x6, 12 feet long, for Lookout on which to build Platform.
2 Pieces 2x4, 16 feet long, for Ladder.
2 Pieces 1x4, 12 feet long, for Ladder.
2 Pieces 2x12, 12 feet long, for Platform
30 Pieces 1x6, 16 feet long, for Braces, Collars and Girts.
4 Anchor Posts, 8 feet long, should be of solid stuff not less than 6x6.
4 Cross Anchors.
5 Pounds of 20d nails for Platform.
20 Pounds of 10d nails for Braces.
8 4½x½ bolts and washers for splicing Main Post.
8 10½x½ bolts and washers for bolting Main Posts to Anchor Posts.

The cost of above material will not exceed $12.00, and the cost of labor, building derrick and erecting mill will be from $8 to $12, as it requires the labor of two men two days. We do not furnish derricks, as they are inconvenient and expensive to ship, and they can be made on the ground cheaper. They are usually furnished by the purchaser or by the agent erecting the mill. Any ordinary carpenter can from our specifications give an estimate of its cost, and by following our description erect one without trouble.

Special directions for building and specifications for material will be furnished by us in all cases where higher derricks are needed.

## Directions for Building 36 foot Derrick for 8½ and 10 foot Engines.



Select the four posts, 4x4, for top of derrick, and cut out the inside corners of each post 2 inches at the top, tapering to a point or nothing in 4 feet. Splice the 4x4 posts together with a 2 foot splice, in the manner indicated in cut, saw the ends square and see that the four posts are exactly the same length; lay them side by side and space off for the girts, marking square across the four posts at once. The top edge of the first girt should be 68 inches from top of derrick. The top edge of lower girt should be 90 inches from the lower end of posts, divide the distance between the upper and the lower girt equally for two other girts. Lay two posts side by side with their ends exactly even, insert a pieces 1 inch thick, 2 inches wide and 4 inches long, between the top ends, which will make the posts measure 9 inches across at the top from outside to outside. Spread the posts so that they will measure 14 inches across from outside to outside, 62 inches from the top. Nail on the top collar using the first one for a pattern by which to cut the remaining three two of which should be 2 inches longer than the first to allow for lap. Observe the same rule in cutting all the girts. Nail on the first girt 9 inches from the top and second 68 inches from the top as marked. Go to the bottom of the posts and spread the ends 9 ft. apart. (The rule is 1 ft. spread for every 4 ft. in height.) Nail a temporary stay on both to hold them there, then draw a chalk line from the bottom of one post to the top and around to the bottom of the other post. Measure from the line to the outside edge of each post and move the posts back and forth until the distance from the line to the outside edge of each post is the same at each girt; this will give you the correct spring of the posts. (These directions should be strictly observed.) Nail on lower girt 90 inches from bottom, and remaining 2 at equal distances, as marked. Nail on diagonal braces across from each girt to the one above each way, and see that inside corner of each brace is even with inside edge of post, and trim outside corner even with outside edge of post; use first brace for a pattern to cut remaining 7 in that section by allowing 2 inches for lap on 4, as in the girts. Nail on lookout as sill for platform, (2x6x6) let its lower edge rest on the upper edge of first girt. When this side of derrick is complete turn it upside down with girts and braces on ground, lay the remaining posts on top of

the first and build that side of the derrick exactly like the first, being careful to nail the girts on exactly opposite the first. Insert the one-inch strips between the upper and lower posts and nail on the two remaining collars at the top and the first girts, then block up under the lower post until the posts have the same spring at each girt as they have the other way. Nail on the remaining girts on two sides, and braces on one side and complete ladder side as shown in cut. Raise the derrick with pike poles. A rope fastened near the top will greatly facilitate the work of raising when the derrick is about half-way up. Drop a plumb line from the center of the derrick at the top, and when the derrick stands perfectly plumb bolt to the anchor posts, which should be not less than 6 inches square and 4 feet in the ground, with a cross anchor near the bottom of each anchor post as shown in cut. Complete platform as shown in cut on page 8.

## Directions for Setting Up 8½ foot 6-Bucket Engines and 10 foot 7-Bucket Engines.

Lay a spirit level against the side of the derrick at the top and mark around so you can square off perfectly level for the bed plate casting H 2. Take off collar E 87, adjustable collar E 7, bed plate H 2 from stem of turn table, and place bed plate H 2 on top of derrick posts. Mark holes in the top of posts for bolts and bore six inches deep with a $\frac{9}{16}$ inch bit. Bore into the side of the post just under the collar to meet the bolt hole, and square out with a chisel to admit the nut—use the pointed bolts to secure the bed plate H 2 to the top of derrick. Lay a spirit level on top of the bed plate H 2 and if it is not perfectly level adjust it by paring off top of post with a chisel. It is imperative for the successful working of the engine that the top of bed plate H 2 be perfectly level. Next lash or clamp a gin-pole 12 feet long to the posts of the derrick, with its lower end resting on the platform, its upper end about five feet above top of derrick. Attach a rope and pulley to upper end of gin-pole, raise the engine, and pass spindle down through bed plate H 2; put adjustable collar E 7 and collar E 87 on spindle of turn table, and fasten collar E 87 by set screw, close to lower end of spindle. Prepare four wood clamps ten inches long, four inches wide and one inch thick, bore holes in center of each to admit stud bolts in adjustable collar E 7. Put clamps on outside of derrick and fasten with nuts. See that the spindle of turn table is perfectly plumb by square and level and tighten up nuts on outside of clamps. Revolve engine and be careful that set screw in collar E 87 does not touch inside of posts. Engine should revolve in socket of H 2 perfectly free. Slip casting No. H72 on top of upright bar on engine and tighten by set-screw. Put the end of vane rod which has the nut on into hole near the out end of tail vane. Tie the hook end of vane rod to vane shaft and raise the vane by means of the rope and pulley; slip the end of vane shaft into the socket of intermediate H 5, and secure by bolt. Attach vane chain to hook on H 72 and adjust by swivel in rod and link in chain, until vane hangs in socket of intermediate H 5 just clear of the bottom. If 10 ft. engine bolt flange brake wheel H 36 to arms of spider with loop bolts. Next raise the wheel hub and place on shaft in such position that counter sinks in shaft will correspond with set screws in hub, then insert bolt in outer end of hub and turn down set screws tight, and tighten lock nuts to hold them secure, then tighten both nuts on bolt at outer end of hub. Next raise the buckets and bolt them into the arms of wheel hub. Next brace the wheel as per directions on this page. Screw the glass oiler into the pitman just over the wrist pin. Screw No. E 54 (with wooden actuating rod attached) securely to end of gas pipe, which projects below the spindle of the mill between the posts of the derrick. Put brake lever H 381 on to brake fulcrum and fasten with bolt. Put stud with H 77 pulley attached, through hole in turn table H 1X under main shaft box and turn up nut tight. Attach the pull-out chain to the open band on vane shaft. Pass the pull out chain around pulley H 77 and under pulley on brake lever H 381 and up over pulley H 24 down through the slot in the pitman and through the center of gas pipe; the lower end of chain will come out at lower end of pipe. Attach the lower section of wooden actuating rod and make the connection to pump, being careful to have the pump plumb under the center of the mill, so there will be no side draft. In connecting to pump see that when the mill is on the center of its stroke the pump is also on its center stroke, otherwise the plunger will be likely to strike either the bottom or the top of the pump cylinder. Nail guides across the derrick at each girt for the actuating rod to pass through. They will steady the rod and prevent springing. Attach galvanized wire to swivel on lower end of pull-out chain and at a convenient distance from the ground fasten it to a lever, one end of which may be bolted to one of the derrick posts.

## Directions for Bracing and Putting Together 8½ and 10 Foot Engine.

### WHEELS.

Hook the eye end of a medium brace over the threaded end of a long brace

and put the threaded end of the long brace through the hole in the edge of the wing near the heel of bucket. Before putting on the nut, hook the eye end of a long brace over the threaded end of the long brace that projects through the hole in the wing, and put on nut but do not tighten it. Next take off one of the two nuts on the end of the medium brace and put the end of the brace through the hole in the edge of the next bucket, back near the outer end, and put on nut but do not tighten it. This will show the relative position of all the braces. Go straight around the wheel proceeding in like manner, When the braces are all on, tighten up nuts of long braces gradually all around the wheel and the nuts of medium braces on back side of wheel, they will all be connected and will support the wheel in every direction. Next put on short brace from bow to wing of bucket and tighten nuts holding bucket to spider.

### OILING ENGINE.

Fill the glass oiler No. 25 with good oil that will not congeal in cold weather—winter strained lard oil mixed with about one-third coal oil is the best for this purpose. Adjust the flow of oil by the little temper screw in the lower part of the oiler, by turning the screw to the left, the flow is reduced so that one-quarter turn will close it entirely. Oil the wheel shaft through holes in box cap H 4×. Oil the bearings at upper and lower end of pitman, on the elbow of casting H 3, the swivel H 44, also the top of bed plate H 2. About once a month pour coal oil around bed plate H 2, and turn table H 1× and cut out the gum and dried oil perfectly clean; never use poor or cheap oil on the engine. A wind mill cannot be expected to run without oil, or gummed up, any more than your wagon or reaper. The mill should be oiled thoroughly once a week or more frequently.

### ADJUSTING.

The governing device of the Iron Turbine is very simple, and is adjusted when it leaves the factory to run from 30 to 40 revolutions per minute, doing ordinary work without blowing out of wind. By moving HX eccentric away from the chain on vane rod the wheel will blow out of wind easier. By moving it toward the chain the wheel will be held more strongly to the wind. Should the wheel fail to come into wind frhely when pulled out, move the HX eccentric out toward the vane. The wheel can be held in wind up to 60 revolutions a minute if required and yet blow out in a gale.

### CHANGING LENGTH OF STROKE.

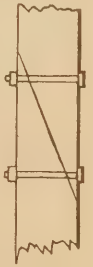
The elbow casting H 3 is provided with three holes in its upper end where the pitman is attached. When the pitman is in the upper hole the mill is on the shortest stroke, 3 inch. When in the center hole it is on the medium stroke, 3½ inch. When in the lower hole it is on the longest stroke, 4 inch.

### ADJUSTING COUNTER BALANCE.

Turn the wheel of the engine till actuating rod barely begins to move on the upward stroke and bolt counter balance on the spokes at the top of the wheel just off the center to the left, when standing back of the wheel. Adjust the counter balance by moving out or in on the spokes until it balances the actuating rod, and the wheel will remain stationary at any position. If possible always adjust the counter balance when wind is not blowing. The counter balance is not needed on wells from 10 to 20 feet deep and may be taken off.

## Directions for Building 36 ft. Derrick for 12 ft. 10-Bucket Engines.

Select the four posts, 4x6, for top of derrick and cut out the inside of each post two inches at the top, tapering to a point or nothing in 15 feet, making posts at top 4 inches square. Cut out the inside corners of each post 2 inches at the top, tapering to a point or nothing in 5 feet. Splice the posts together with a two foot splice in the manner indicated in cut, saw the ends square and see that the four posts are exactly the same length; lay them side by side and space off for the girts, marking square across the four posts at once. The top edge of the first girt should be 9 inches and the top edge of the second 80 inches from top of derrick. The top edge of lower girt should be 90 inches from the lower end of posts, divide the distance between the upper and lower girt equally for two other girts. Lay two posts side by side with their ends exactly even, insert a piece 2 inches thick, 2 inches wide and 4 inches long between the top ends which will make the posts measure 10 inches across at the top from outside to outside. Spread the posts so that they will measure 16 inches across from outside to outside, 72 inches from the top. Nail on the top collar using the first one for a pattern by which to cut the remaining three, two of which should be 2 inches longer than the first to allow for lap. Observe the same rule in cutting all the girts. Nail on the first girt 9 inches and second girt 80 inches from the top as marked. Go to the bottom of the posts and spread the ends 9 feet apart.



(The rule is 1 foot spread for every four in height.) Nail a temporary stay on both to hold them there, then draw a chalk line from the bottom of one post to the top and around to the bottom of the other post. Measure from the line to the outside of each post and move the posts back and forth until the distance from the line to the outside edge of each post is the same at each girt. This will give you the correct spring of the posts. (These directions should be closely observed). Nail on the lower girt 96 inches from the bottom and the remaining two at equal distances, as marked. Nail on the diagonal braces across from each girt to the one above, each way, and see that the inside corners of each brace is even with the inside edge of each post, use the first brace for a pattern to cut the remaining seven in that section by, allowing two inches for lap on four as in the girts. Nail on the look-out as sill for platform (2x6x6), let its lower edge rest on the upper edge of the first girt. When this side of the derrick is complete turn it upside down with the girts and braces on the ground, lay the remaining posts on top of the first and build that side of the derrick exactly like the first, being careful to nail the girts on exactly opposite the first. Insert the two inch strip between the upper and lower posts and nail on the two remaining collars at the top and the first girts, then block up under the lower post until the posts have the same spring at each girt as they have the other way. Nail on the remaining girts on two sides, and braces on one side and complete ladder side as shown in cut. Raise the derrick with pike poles. A rope fastened near the top will greatly facilitate the work of raising when the derrick is about one-half way up. Drop a plumb line from the center of the derrick at the top, and when the derrick stands perfectly plumb bolt to the anchor posts, which should be not less than 8 inches square and 6 feet in the ground, with a cross anchor near the bottom of each anchor post, as shown in cut. Complete platform as shown in cut on page 8.

## Directions for Setting Up 12 Foot 10-Bucket Engines.

Lay a spirit level against the side of the derrick at the top and mark around so you can square off perfectly level for the bed plate casting H 15. Take off collar E 27, adjustable collar E 37, and the bed plate H 15 from the stem of the turn-table and place bed plate H 15 on top of derrick posts. Mark holes in the top of posts for bolts and bore six inches deep with a ⅝ bit. Bore into the side of the post just under the collar to meet the bolt hole, and square out with a chisel to admit the nut—use the pointed bolts to secure the bed plate H 15 to the top of derrick. Lay a spirit level on top of the bed plate H 15, and if it is not perfectly level adjust it by paring off top of posts with a chisel. It is imperative for the successful working of the engine that top of bed plate H 15 be perfectly level. Next lash or clamp a gin-pole 12 feet long to the posts of the derrick with its lower end resting on the platform, its upper end about 5 feet above top of derrick. Attach a rope and pulley to upper end of gin-pole, raise the engine and pass spindle down through bed plate H 15; put adjustable collar E 37 and collar E 27 on spindle of turn table and fasten collar E 27 by set screws close to lower end of spindle. Prepare four oak clamps ten inches long, four inches wide and one inch thick, bore holes in center of each to admit stud bolts in adjustable collar E 37. Put clamps on outside of derrick, with bolts of adjustable collar E 37 passing through holes, and fasten with nuts. See that the spindle of turn table is perfectly plumb by square and level, and tighten up nuts on outside of clamps. Revolve engine, and be careful that set screw on collar E 27 does not touch inside of posts. Engine should revolve in socket of H 15 perfectly free. Slip casting H 71 on top of upright bar on engine and tighten by set-screw. Put the end of vane rod which has the nut on into hole near the outer end of tail of vane. Tie the hook end of vane rod to the vane shaft and raise the vane by means of the rope and pulley; slip the end of vane shaft into the socket of intermediate H 14 and secure by bolt. Attach vane chain to hook on H 71 and adjust by swivel in rod and nk in chain until the vane hangs in socket of intermediate H 14 just clear of bottom. Slip flange brake wheel H 62 on to the main shaft with flange towards the engine. Next raise the wheel spider and place on shaft in such position that counter sinks on shaft will correspond with set screws in hub, then insert bolt in the outer end of hub and turn down the set-screws tight, and tighten the lock nuts to hold them secure. Then tighten both the nuts on the bolt at the outer end of the hub. Bolt the flange brake wheel to spider arms. Next raise buckets and bolt them into arms of spider, but do not turn nuts tight. Next brace wheel as per directions on next page. Screw glass oiler into pitman just above the wrist pin. Screw A 29 (with wooden actuating rod attached) securely to end of gas pipe which projects below the spindle of the mill between the posts of the derrick. Put brake H 38X on to brake fulcrum and fasten with bolt. Put stud with H 77 pulley attached through hole in turn table H 13X under main shaft box and turn up nut tight. Put vane clamp H 66 on vane shaft 12 inches from the end of socket of

intermediate H 14. Attach the pull-out chain to the eye of stud H 77. Pass the pull-out chain through pulley on vane, around pulley H 77, under pulley on brake lever H 38X and up over pulley H 24 down through the slot in the pitman and through the center of gas pipe; the lower end of chain will come out at lower end of pipe. Attach the lower section of wooden actuating rod and make the connection to pump, being careful to have the pump plumb under the center of the mill, so there will be no side draft. In connecting to pump see that when the mill is on the center of its stroke the pump is also on its center stroke, otherwise the plunger will be likely to strike either the top or the bottom of the pump cylinder. Nail guides across the derrick at each girt for the actuating rod to pass through. They will steady the rod and prevent springing. Attach galvanized wire to swivel at the lower end of pull-out chain. Bolt pull-out windlass to corner post of derrick, and connect chain on windlass to the galvanized wire.

## Directions for Bracing and Putting Together 12 foot 10-Bucket Engines.

### BRACING WHEEL.

Put on short braces from bow to wing of bucket. Put saucer No. E 40 on end of main shaft, concave side out, put on nut but do not tighten it. Take off one nut from each brace. Hook the eye end of a short medium brace over the bent threaded end of a long medium brace, and put the threaded end through the hole in the wing of a bucket from the backside. Put the eye end of a long medium brace over the threaded end of a long medium brace projecting through the hole in the bucket, put on nut but do not tighten it. Put the threaded end of a long brace through a hole in the saucer No. E 40, and put on nut on inside of saucer. Put the eye end of the long brace over the bent threaded end of the short medium brace, and put the end of the short medium brace through hole in the point of the bucket. Put on nut but do not tighten it. Hook the eye end of another short medium brace over the bent threaded end of the long medium brace already on wheel and put the threaded end through hole in next bucket, and proceed as before around the wheel. When all the braces are on tighten up the nuts gradually around the wheel, then all on the inside of the saucer, the nut on the main shaft, and the nuts on bucket and spider.

### OILING ENGINE.

Fill the glass oiler No. 25 with some good oil that will not congeal in cold weather. Winter strained lard oil mixed with about one-third coal oil is the best for this purpose. Adjust the flow of oil by the little temper screw in the lower part of the oiler. By turning the screw to the left the flow is reduced so that one-quarter turn will close it entirely. Oil the wheel shaft through holes in box cap H 16X. Oil the bearings at upper end of pitman, at the elbow of casting H 31, the swivel H 45, the top of bed plate H 15 under H 13X. About once a month pour a pint of coal oil around bed plate H 15 and turn table H 13X, and cut out the gum and dried oil perfectly clean; never use poor or cheap oil on the engine. A wind mill cannot be expected to run without oil, or gummed up any more than your wagon or your reaper. The mill should be oiled thoroughly once a week.

### ADJUSTING COUNTER BALANCE.

Turn the wheel of the engine till actuating rod barely begins to move on the upward stroke, and bolt counter balance on the spokes at the top of the wheel just off the center to the left, when standing back of wheel. Adjust the counter balance by moving out or in on the spokes until it balances the actuating rod, and the wheel will remain stationary at any position. If possible always adjust the counter balance when the wind is not blowing.

### CHANGING LENGTH OF STROKE.

The elbow casting No. 31 is provided with three holes in its upper end where the Pitman is attached. When the pitman is in the upper hole the mill is on the shortest stroke, 3⅛ inch; when in the center hole it is on the medium stroke, 3⅝ inch; when in the lower hole it is on the longer stroke, 4⅛ inch.

### ADJUSTING.

The governing device of the Iron Turbine is very simple and is adjusted when it leaves the factory to run from 30 to 40 revolutions a minute, doing ordinary work, without blowing out of wind. By moving HZ eccentric away from the chain on vane rod the wheel will blow out of wind easier. By moving it toward the chain the wheel will be held more strongly to the wind. Should the wheel fail to come into wind freely when pulled out, move the HZ eccentric out toward the vane. The wheel can be held in wind up to 60 revolutions a minute if required and yet blow out in a gale.

**List of Materials for 36 foot Derrick for 12 foot 10-Bucket Engines.**

8 pieces 4x6, 18 or 20 feet long, for Main Posts.
1 piece 2x6, 12 feet long, for Lookouts, on which to build Platform.
2 pieces 2x4, 16 feet long, for Ladder.
2 pieces 1x4, 12 feet long, for Ladder.
2 pieces 2x12, 12 feet long, for Platform.
1 piece 2x12, 30 inches long, for Platform.
30 pieces 1x8, 16 feet long, for Braces, Collars and Girts.
4 Anchor Posts, 8 feet long, should be of solid stuff not less than 6x8.
4 Cross Anchors.
5 pounds 20d nails for Platform.
20 pounds 10d nails for Braces.
8 4½x½ bolts and washers for splicing Main Posts.
8 12½x½ bolts and washers for bolting Main Post to Anchor Posts.

The cost of above material will not exceed $15.00, and the cost of labor, building derrick, and erecting mill will be from $8 to $12, as it requires the labor of two men two days. We do not furnish derricks as they are inconvenient and expensive to ship, and they can be made on the ground cheaper. They are usually furnished by the purchaser or by the agent erecting the mill. Any ordinary carpenter can, from our specifications, give an estimate of its cost, and by following the directions erect one without trouble.

Special directions for building and specifications for material will be furnished by us in all cases where a higher derrick is needed.

# POWER OF THE IRON TURBINE MILL.

We are often asked the horse power of the Turbine Wheel. The power of a wind mill varies as the wind varies, and as it is impossible to obtain a uniform pressure of the wind on the wheel, it is equally impossible to answer such inquiries correctly. The power of a mill is best understood by the amount of work it will do. Hence, in the accompanying tables we give the capacity of mill for pumping water. We recommend a ten foot wheel for stock pumping, as it will run in a light wind, and on that account will give better satisfaction during the calm summer months.

## CAPACITY OF BUCKEYE PUMPS AND TURBINE ENGINES.

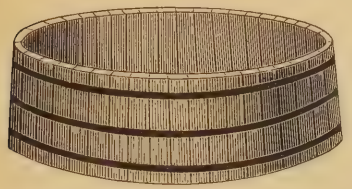
**SPEED OF ENGINE, 40 STROKES PER MINUTE.**

| Size of Engine. | Stroke of Engine. | 2¼ inch cyl Pump | 2½ inch cyl Pump | 3 inch cyl Pump | 3½ inch cyl Pump | 4 inch cyl Pump | 5 inch cyl Pump |
|---|---|---|---|---|---|---|---|
| 10 feet. | 3 inch. | 120 gallons | 153 gallons | 220 gallons | 300 gallons | 392 gallons | 612 gal. hr |
| 10 " | 3½ " | 140 " | 178 " | 250 " | 350 " | 457 " | 713 " " |
| 10 " | 4 " | 165 " | 200 " | 293 " | 400 " | 523 " | 816 " " |
| 12 " | 3⅛ " | 130 " | 163 " | 230 " | 313 " | 408 " | 637 " " |
| 12 " | 3⅜ " | 150 " | 183 " | 267 " | 363 " | 473 " | 738 " " |
| 12 " | 4½ " | 180 " | 255 " | 326 " | 450 " | 588 " | 920 " " |

**PRICE OF ENGINES.**

| | | | | | |
|---|---|---|---|---|---|
| **No. 1** | Diameter 8½ ft. | For shallow wells where little water is needed. | | Shipping wt. 400 pounds. | $75 00 |
| **No. 2** | Diameter, 10 ft. | For wells to 150 ft. deep. | Will pump water for 200 head of stock. | Shipping wt. 450 pounds. | $85 00 |
| **No. 3** | Diameter, 12 ft. | For wells to 250 ft. deep. | Will pump water for 400 head of stock. | Shipping wt. 600 pounds. | $125 00 |

☞ We furnish the Wind Mill with actuating or pump rod, for 36 feet derrick, and connection for pump, boxed ready for shipping. The derrick, or tower, pumps, tanks, pipe, &c., are extra, (see price list.) In all cases purchasers must pay freight from the factory to destination.



## ROUND STOCK TANKS.

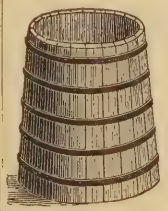
2 inch Lumber.

| Lg. of Stave | Dia. of Bottom | No. of Hoops | Capacity. | PRICE. |
|---|---|---|---|---|
| 2 ft. | 6 ft. | 2 | 12 bbls | $18 00 |
| 2½ ft. | 6 ft. | 2 | 15 bbls | 20 00 |
| 2 ft. | 8 ft. | 2 | 22 bbls | 26 50 |
| 2½ ft. | 8 ft. | 2 | 25 bbls | 30 00 |
| 2 ft. | 10 ft. | 2 | 33 bbls | 36 00 |
| 2½ ft. | 10 ft. | 2 | 42 bbls | 44 00 |

## ROUND Supply Tanks.

2 in. Lumber.

| Length of Stave. | Diam. of Bottom. | No. o Hoops. | Capacity. | PRICE. |
|---|---|---|---|---|
| 5 feet. | 5 feet. | 4 | 20 barrels. | $28 00 |
| 6 feet. | 5 feet. | 4 | 24 barrels. | 30 00 |
| 5 feet. | 6 feet. | 4 | 30 barrels. | 33 00 |
| 6 feet. | 6 feet. | 4 | 36 barrels. | 36 00 |
| 7 feet. | 6 feet. | 5 | 42 barrels. | 42 00 |
| 6 feet. | 7 feet. | 5 | 50 barrels. | 46 00 |
| 7 feet. | 7 feet. | 5 | 60 barrels. | 50 00 |
| 7 feet. | 8 feet. | 5 | 80 barrels. | 60 00 |
| 8 feet. | 8 feet. | 6 | 90 barrels. | 66 00 |
| 9 feet. | 8 feet. | 6 | 100 barrels. | 70 00 |

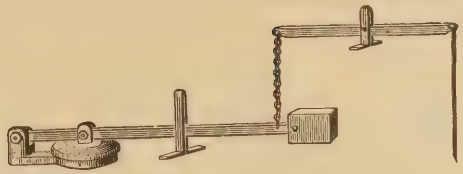


☞ *ESTIMATES GIVEN ON LARGER SIZES.*

Our tanks are made by improved machinery, all parts being uniform and are made of selected lumber free from sap, shakes and unsound knots, well hooped, and if properly set up and allowed a proper time to swell, will not leak. We will quote prices on tanks made of clear pine, when desired. The above prices are for bottoms, staves and hoops knocked down for shipment.

## FLOAT VALVES WITH PAN.

| | |
|---|---|
| For ¾ inch pipe | $2 00 |
| For 1 inch pipe | 2 25 |
| For 1¼ inch pipe | 2 50 |
| For 1½ inch pipe | 2 75 |



## TANK VALVES.

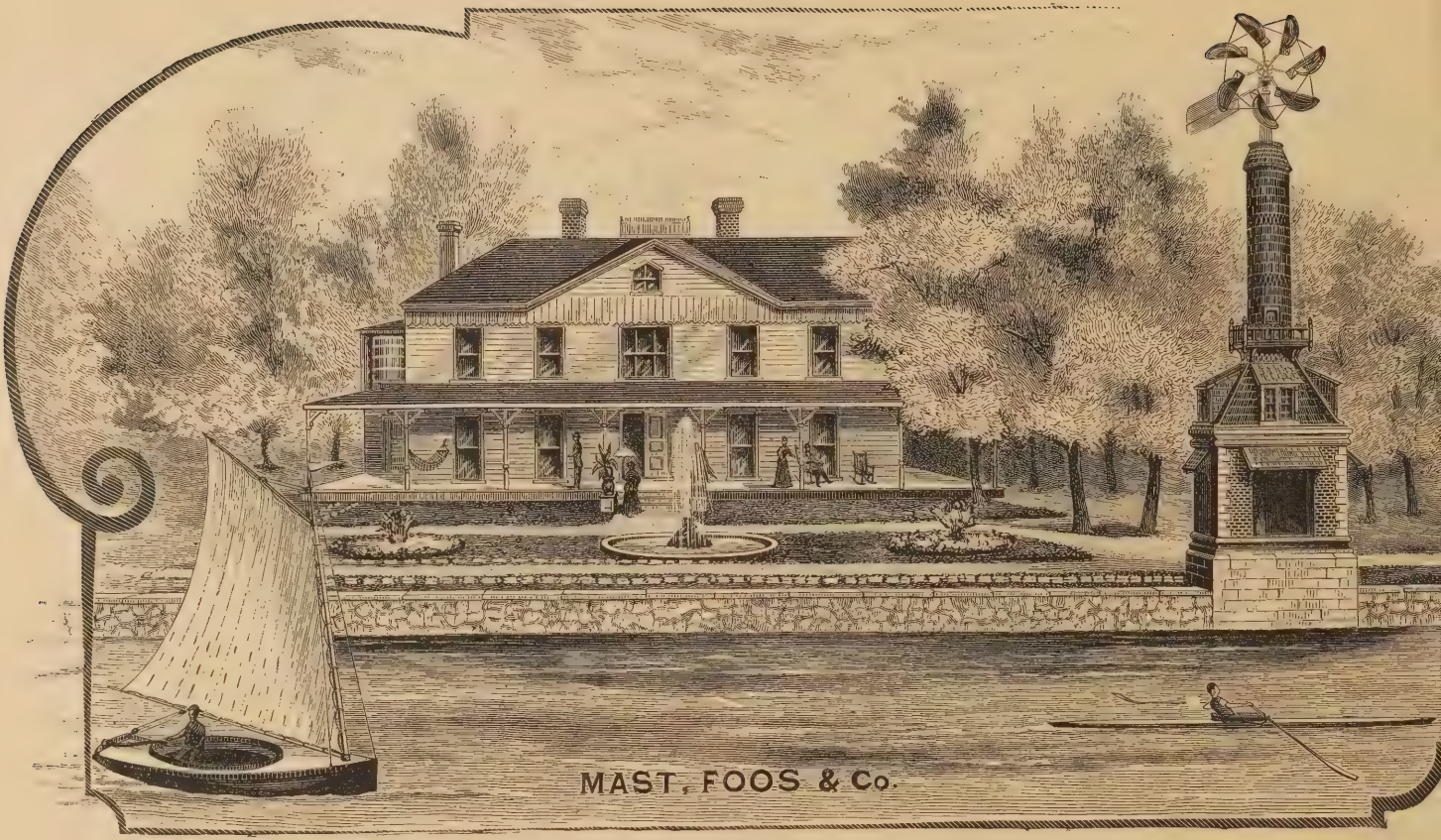
| | |
|---|---|
| For 1 inch pipe | $1 50 |
| For 1¼ inch pipe | 1 75 |
| For 1½ inch pipe | 2 00 |
| For 2 inch pipe | 2 25 |
| For 2½ inch pipe | 2 50 |

## PUMP ROD AND ROD COUPLINGS.

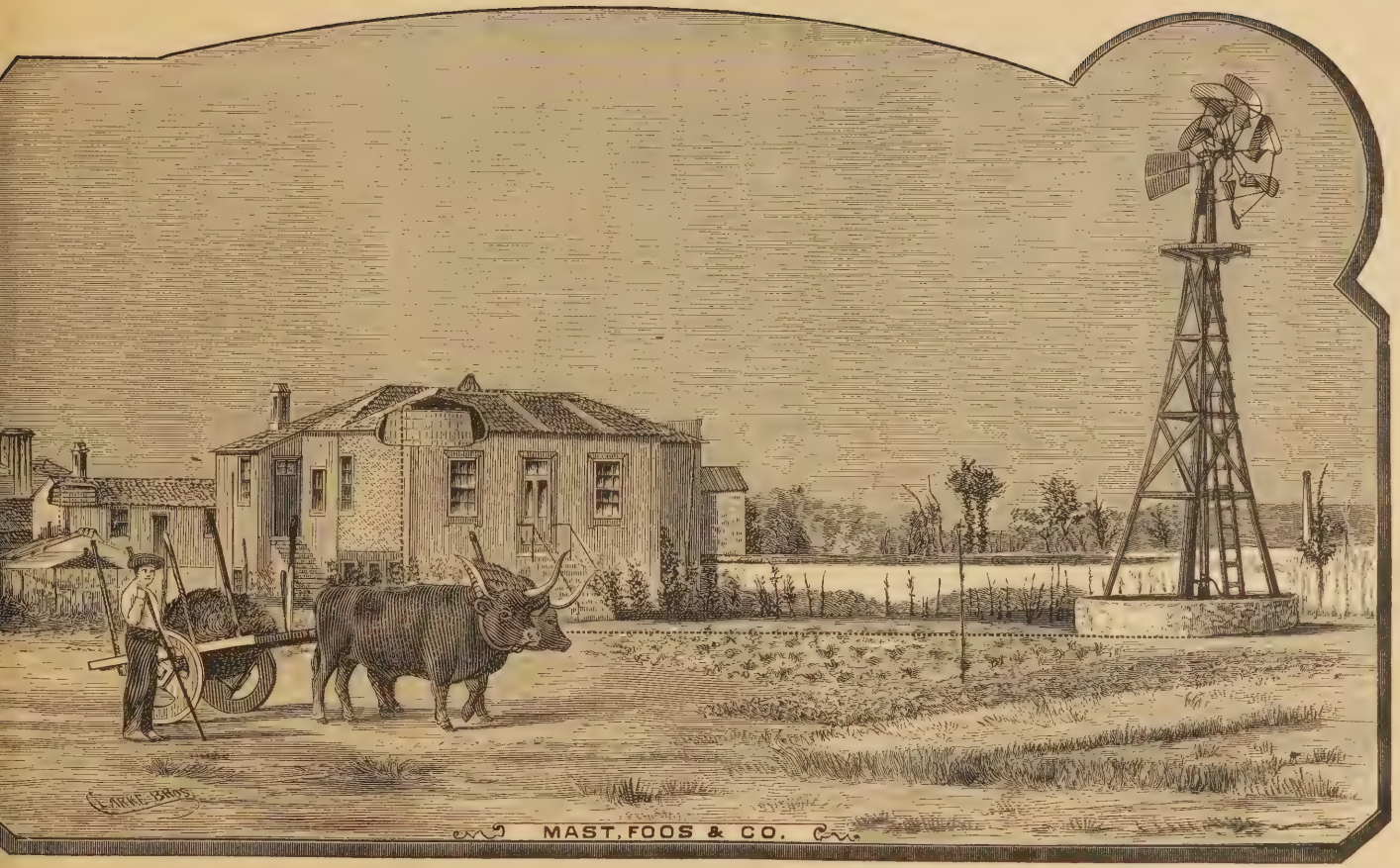
| | |
|---|---|
| 7-16 inch Plain Rod Couplings, threaded, each | .04 |
| 7-16 inch Galvanized Rod Couplings, threaded, each | .06 |
| 7-16 inch Plain Rod and Couplings, threaded, per foot | .06 |
| 7-16 inch Galvanized Rod and Couplings, threaded, per foot | .07 |
| ⅜ inch Galvanized Couplings, threaded, each | .06 |
| ⅜ inch Galvanized Steel Rod and Couplings, threaded, per foot | .08 |
| ⅜ inch Galvanized Steel Rod, not threaded, per foot | .07 |

## WARRANTY ON IRON TURBINE WIND ENGINE.

We warrant said Wind Engine to be well made, of good material, and if properly oiled and cared for, capable of doing as good work as any mill of its class in the market, and we further guarantee to furnish all repairs necessary for one year when breakages occur by fair usage. We do not guarantee against cyclones, tornadoes, or any wind that will blow down trees, fences or buildings in the vicinity. This warranty to apply to the Mill only; not to pump, tower, tank, or anything outside the mill proper. This Company will not recognize nor be responsible for any understanding with the Agent not named in the contract, or any addition to this printed warranty.




*A COUNTRY SEAT ON THE DELAWARE.—Residence of R. W. Satterthwaite.*




*SCENE IN PORTUGAL.—The Iron Turbine on the grounds of our agent general at Oporto.*

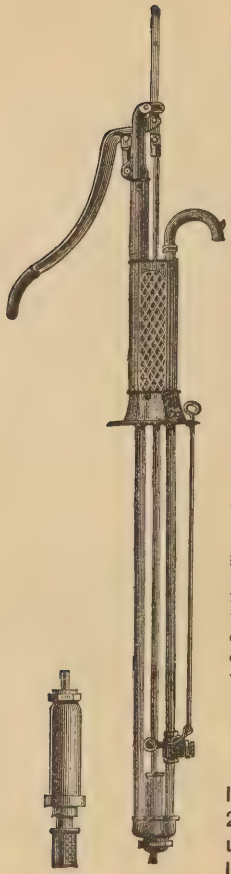
# OUR ILLUSTRATIONS.

The five illustrations printed herewith tend to show the universal adaptability of the improved Iron Turbine to all uses, all sections and all countries. These illustrations were made from photographs and are fac-simile reproductions of the actual scenes. Please note the brief descriptions given below:

**A COUNTRY SEAT ON THE DELAWARE.**—Among the first objects noted by the visitor at the country seat of Mr. R. W. Satterthwaite, located at Edgewater Park on the New Jersey side of the Delaware river, about 16 miles east of Philadelphia, is the magnificent tower on the water's edge with its Iron Turbine equipment. Mr. Satterthwaite has probably made a larger investment in order to provide an elaborate water works than any other private citizen or single individual in the country. Yet so entirely satisfactory are his pumping and distributing arrangements that he has cause every day to congratulate himself on the thoroughness and efficiency of his water supply equipment. Mr. Satterthwaite made his selection of the Iron Turbine in 1876, after examining a number of mills and satisfying himself that ours was the one best calculated to meet the requirements of a private water works system. He then negotiated the purchase of the exhibit of a firm at the Centennial Exposition, who were showing carved mantels, fancy door facings, slate and gray marble work, etc., valued at $6,000. Of this material, which consisted largely of red granite, pressed brick and marble, he constructed on the bank of the river a magnificent tower, which is the finest ornament in his spacious and attractive grounds. The illustration gives a view of his residence, grounds and tower looking from the river. There is a special stairway inside of the tower to the first lookout platform with the railing around. From that point there is an iron ladder on the rear side to the top. The tank is in the tower, and there is also one in the attic of the house. Safety valves are used between stop cocks to control the flow of water to the tanks which supply the house with hot and cold water. The Iron Turbine is being used very extensively throughout different parts of the country in a similar manner and for similar purposes, though few would care to put as much money into the equipment as Mr. Satterthwaite has. It is peculiarly well adapted to these uses.

**THE IRON TURBINE IN CALIFORNIA.**—We have a very large California and Pacific Coast trade. It has been found that our mills are better adapted to the wants of the farmers, stock raisers, fruit growers, etc., of these sections than any competing mill, and in consequence we are supplying a very large demand. The Iron Turbine is used very largely on the Pacific Coast for irrigating purposes. It is used extensively for similar purposes in Kansas, Texas, Arkansas and other States, as well as in New Mexico, Mexico, the Central American States and other countries. The illustration presents a scene at Riverside, San Bernandino County, California, with the Iron Turbine as the distinguishing feature. The general topography is quite characteristic of California. The mill stands 57 feet from the ground to center of wheel, is provided with a 4-inch cylinder and 2-inch pipe, and lifts the water 104 feet to a galvanized tank in top of tower. A 1½-inch pipe runs from the tank to the building on the crest of the elevation in rear to the right. Under this building is a reservoir 26 x 42 and 5 feet deep. The top of reservoir is 37 feet higher than the surface of ground at the tower, and the distance between the two is 650 feet. It supplies two families, a large number of stock and affords irrigation to a very extended area, including a piece of orchard, a raising grape vineyard and an orange grove. The Iron Turbine is an indispensable possession to the farmers, stock raisers and fruit growers of California. It has successfully solved the perplexing problem of irrigation, for which purpose practical and continued use has shown its value to be inestimable. It is also peculiarly fitted for the climate of the Pacific Coast regions.

*CHARACTERISTIC SCENE ON A TEXAS RANCHO.*



**SCENE IN PORTUGAL.**—This illustration presents a view of the house and gardens of our agent-general—Mr. Herbert W. Cassells—for Portugal, located in the suburbs of Oporto. In order to successfully introduce our mills into an essentially conservative country like Portugal, (in which undertaking he has had most gratifying success), our representative concluded the most practical way was to erect one of the mills in his own gardens, where its manifold advantages could be demonstrated. The mill is used to supply water for domestic purposes. The view is typical of that part of Portugal—the general landscape; the appearance and architecture of the buildings, the primitive ox cart, a "lineal descendant" of the old Roman ox cart, with its two fine bullocks, representative of the magnificent beeves which the country exports in large quantities, particularly to the British Isles, where they are served in that succulent dish, the "Roast Beef of Old England"; all are thoroughly characteristic of that part of the Peninsula. The Iron Turbine is now very popular in Portugal as in the many other foreign countries where it has been introduced. Our export trade is growing rapidly each year, and we are now shipping mills in large quantities to England, France, Spain, Portugal, Italy, Germany, Russia, Austria and other European countries, as well as to Africa and Australia, New Zealand, Tasmania, Sandwich Islands and South America.

**THE IRON TURBINE FOR RAILROAD USE.**—This engraving exhibits a scene at Parker's Station, New Hampshire, on the Concord Railroad. A 12 feet wheel is used, mounted on a 65 feet derrick. The pump has a 3½-inch cylinder, and the well is 25 feet deep. The tank holds 15,000 gallons, and was full at the time the photograph was taken. We furnished the entire outfit in November, 1886, and it has given complete satisfaction. We are supplying a great many railroads with these water supply equipments. This scene in New Hampshire is typical of a great many similar scenes the traveler meets with in nearly all parts of the United States. We guarantee that the Improved Iron Turbine will give better service for railroad uses than any other mill.

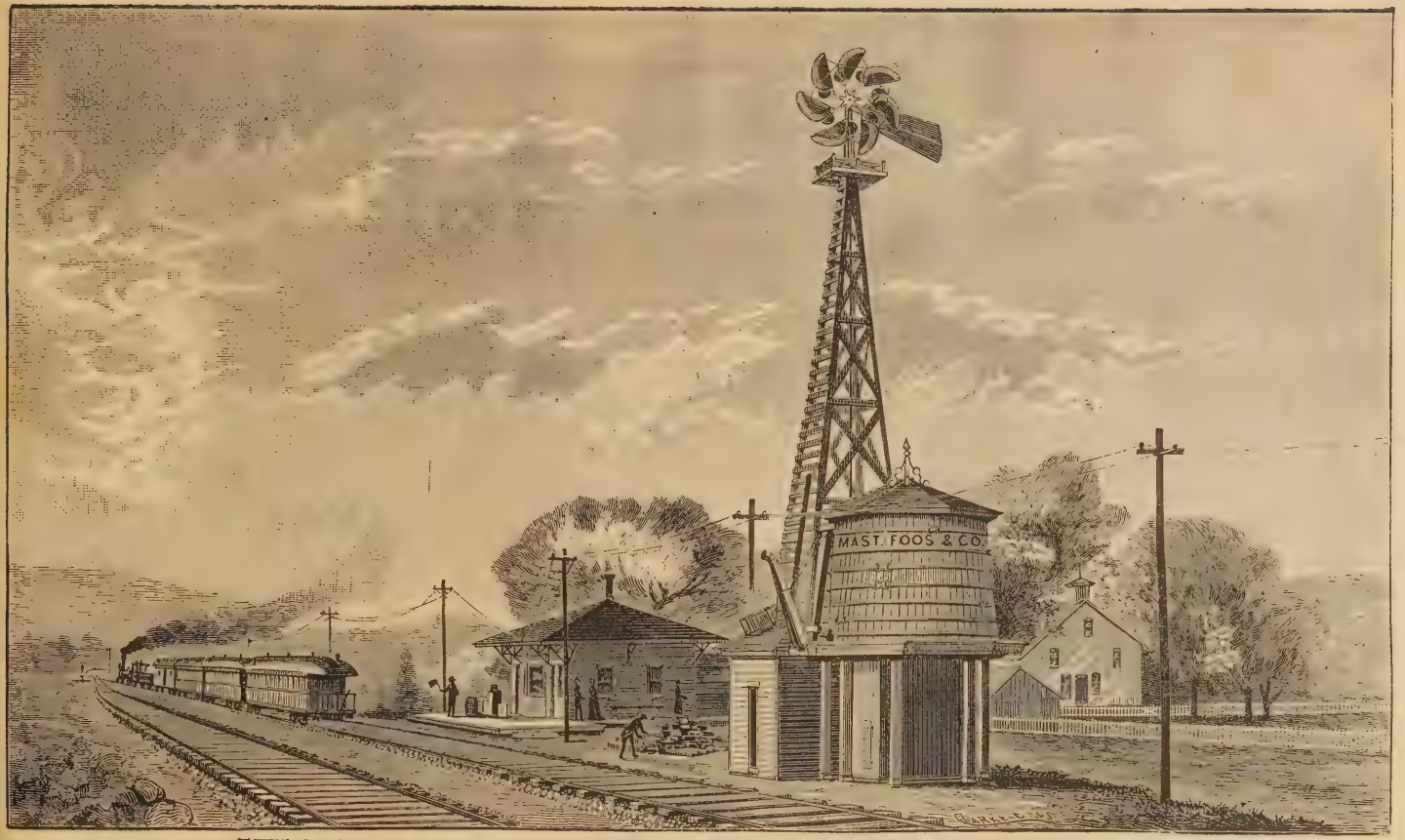
**CHARACTERISTIC SCENE ON A TEXAS RANCHO.**—This illustration gives a good view of a characteristic Texas scene. The photograph was taken at a time of year when the trees were in full leaf. A pipe leads from the tank to the drinking basin in the field as shown to right of picture. The tank holds about 1,200 gallons, and is just sufficiently elevated to cause the water to flow freely to the drinking troughs, etc. This scene is repeated many times throughout Texas. It shows about the usual equipment suitable for a Rancho (or ranch), viz: wheel, derrick, pump, tank and connecting pipes. We furnish the complete outfit, and the large number we have in use indicates their great popularity.

## BUCKEYE FORCE PUMPS.

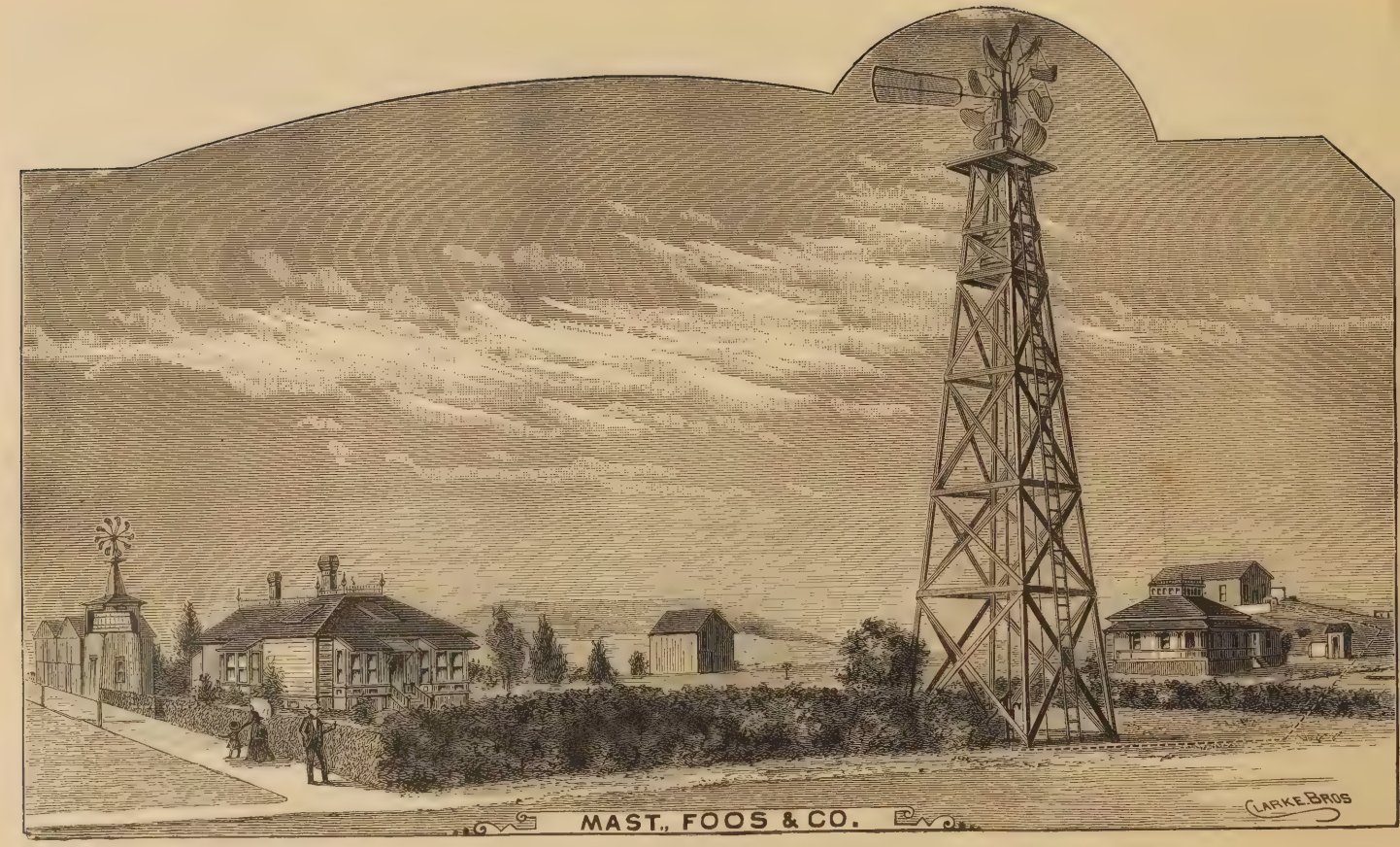
**In connection with our Iron Turbine Wind Engine we manufacture and furnish to the trade the largest and in many respects the best line of Force Pumps in America. There are now in use about 200,000 Buckeye Force Pumps, a much larger number than of any other make. We manufacture a great many different kinds, intended for all possible uses and for wells of all depths. Our line of Pumps for Wind Engine purposes is especially complete. Send for Illustrated Catalogue.**

**USE IRON TURBINE WIND ENGINE WITH BUCKEYE FORCE PUMP FOR**

**Private Water Works Systems, Irrigation, Conveying Water to Different Fields for Stock, Railroad Uses, Forcing Water Long Distances and Pumping Out Deep Wells.**




*THE IRON TURBINE FOR RAILROAD USE.—Scene at Parker's Station, N. H.*




THE IRON TURBINE IN CALIFORNIA.—A perfect water works system.

IRON TURBINE
MAILLEFERT & CO
SPRINGFIELD O

# BUCKEYE

# Wrought and Malleable Iron Fencing,

## Cresting, Balcony Railing, Window Guards, Etc.,

MANUFACTURED BY

# MAST, FOOS & CO.,

SPRINGFIELD, OHIO.

# Buckeye Wrought and Malleable Iron Fencing,

## CRESTING, BALCONY RAILING, WINDOW GUARDS, ETC., ETC.

WE claim many points of superior merit not found in any other Iron Fence made, all of which are covered by Letters Patent owned and controlled by us. This Fence is superior to any now in use, and we can guarantee it to be STRICTLY FIRST-CLASS in every respect, and at a reasonable price.

With the extensive facilities we have for manufacturing, in connection with our other lines of goods, and also the advantages of purchasing our stock in large quantities direct from the Rolling Mills, &c., enables us to furnish our customers with a Fence made from the best materials, in the most workmanlike manner and at the same or less price than at which an ordinary or common iron fence is usually sold.

The wrought iron used in the Buckeye Fence is made specially to order, and the Malleable Iron used for ornamenting is made from the best ***Air Furnace Iron.***

The Buckeye Iron Fence embraces some new, novel and beautiful de signs, never before used in Iron Fencing.

We desire to call your attention to the points of superior merit and the manner of constructing our Fence, as compared with those of other manufacture. While we do not wish to refer to other kinds of fencing in crit icising terms, yet we think it is to the advantage of every one desiring to purchase an Iron Fence to understand the construction of the different kinds in the market. After which you will be better prepared to appreciate the superior merits of the Buckeye Iron Fence.

In the construction of the ***Buckeye Fence*** you will find the following points of superiority :

**1st.—The pickets pass through each and extend BELOW the bottom rail, adding very much to the beauty as compared with other punched rail fences.**

**2d.—Each picket is secured at the junction of each rail by a portion ofthe rail being compressed into a notch in the picket.**

**3d.—In producing the notches in our pickets we remove no material, consequently the picket IS NOT weakened, as is the case in many other fences.**

**4th.—The rail being J shaped, makes a better and more substantial fence than any other, far superior to the old channel rail which has had its day.**

**5th.—In appearance our Buckeye Fence is a combination of both the Ornamental and Plain Punched Fence, but in construction is FAR SUPERIOR.**

**6th.—You will notice in our Ornamental Fence the pickets do not depend on the ornaments for support, but are secured entirely independent of the ornaments.**

**7th.—The Buckeye Fence is built in the shop, complete in panels of five feet each (except when special lengths are required), by experienced workmen, with proper tools and facilities for doing the work as it should be done. Each order is thus made complete and fitted for its particular place, and when shipped is ready to set up at once without trouble, thus overcoming the annoyance of being shipped in boxes and bundles, and to be built on the ground under great disadvantages and out of just such material as is generally sent out in such cases.**

**8th.—Our Fences are all made STANDARD HEIGHT—pickets being full 36 inches long, or 39 inches from ground to top of picket. This height seems to be the most popular; however, the Fence is so constructed that we can make it any height desired.**

**9th.—We use heavier and stronger material than most other makers.**

**10th.—It is very evident that the frost will move any fence more or less, whether on stone or cast iron bases, consequently we make all of our fences so that they can be put in perfect line at any time without disturbing the foundations. Our fences can be built to suit any grade. If over one inch to the foot it should be so stated in the order.**

**11th.—The BUCKEYE is the best fence in the world for agents to handle, as no mechanical skill and but little time is required to erect it.**

# THE BUCKEYE IRON FENCING

IS MANUFACTURED UNDER THE

# MARTIN PATENTS.

We would respectfully call your attention to the numbers and dates of the S. W. Martin Iron Fence and Gate Patents, which are owned and controlled exclusively by Mast, Foos & Co.:

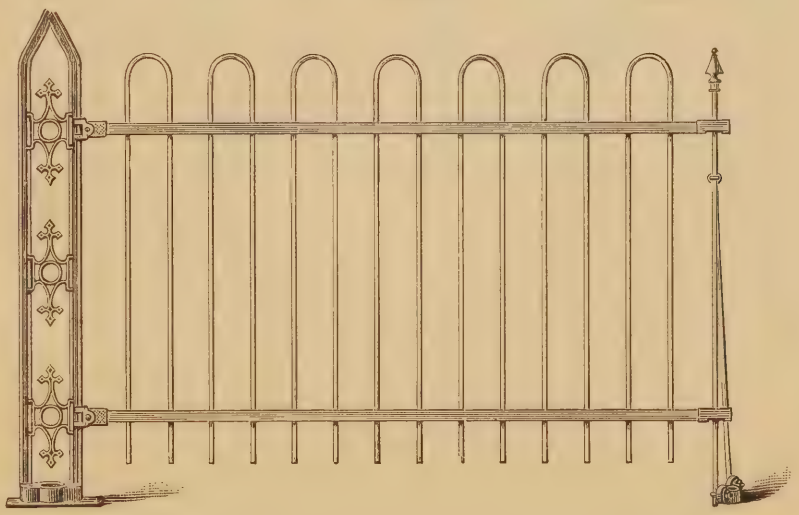
| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Patent No. | 243,280, | Date | June 21, 1881. | Patent No. | 249,037, | Date | Nov. 1, 1881. |
| " " | 245,189, | " | Aug. 2, 1881. | " " | 250,742, | " | Dec. 13, 1881. |
| " " | 248,338, | " | Oct. 18, 1881. | " " | 254,353, | " | Feb. 28, 1882. |
| " " | 249,066, | " | Nov. 7, 1881. | " " | 255,526, | " | March 28, 1882. |

These claims have been carefully examined, and a thorough search of the Patent Office made by competent legal authority, and we are satisfied they can be sustained in their broadest sense.

All persons are cautioned against ***Manufacturing, Buying or Selling*** Iron Fences, Gates, Etc., infringing any rights of the Buckeye Fence Patents, as it is our intention to protect our rights under said Patents.

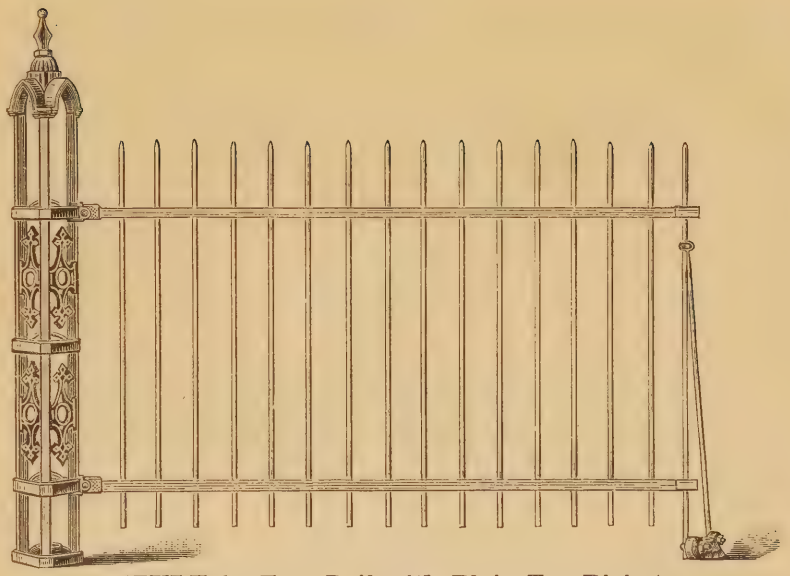
***MAST, FOOS & CO.***





***Style O.***—Two Rail, with bow-top picket.

With this style we represent our new O post. This fence is plain but substantial, and is made of ⅜ round iron only. We would recommend our No. 2 Post on which to hang gates. Suitable for division fence.

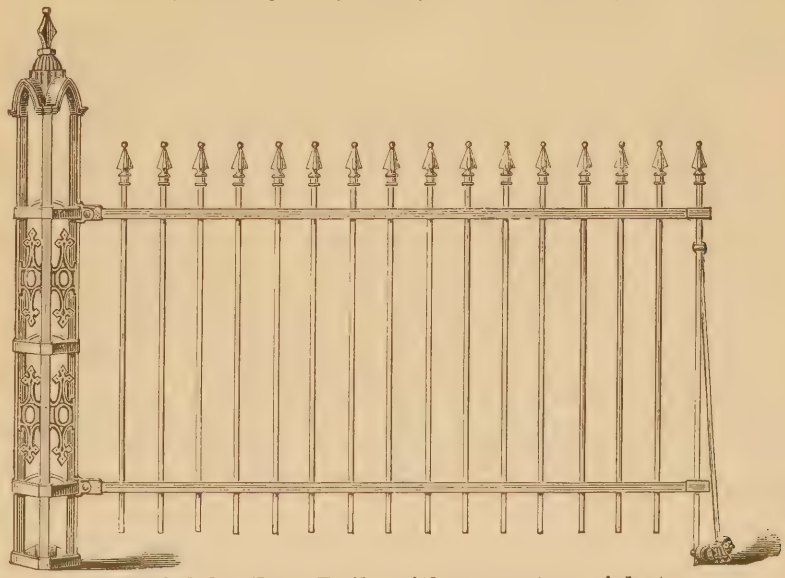


**STYLE 1.—Two Rail with Plain Top Picket.**

This is a plain, but neat and substantial Wrought Iron Fence, suitable for Cemetery Lots, Front or Division Fences.

(*For size of Rails, Pickets, etc., see Price List.*)





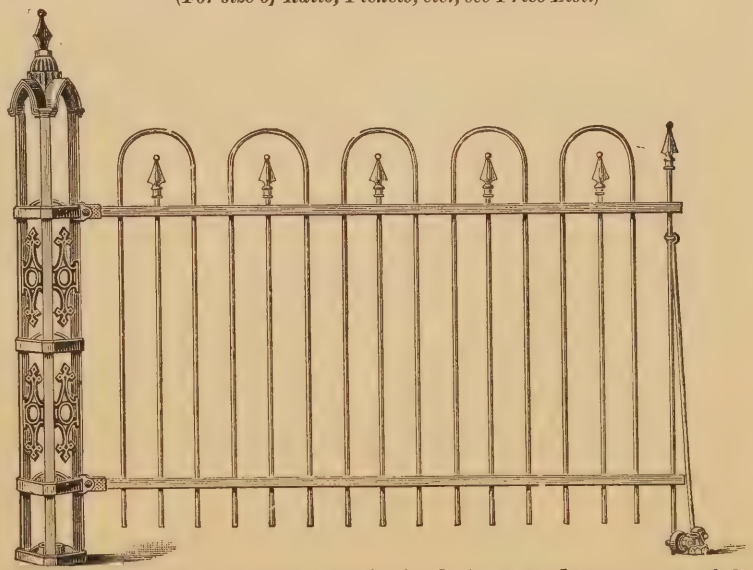
**STYLE 2.—Two Rail, with spear-top pickets.**

**This fence is similar to Style 1 in construction, the only difference being that the spear top gives it a handsome appearance.**

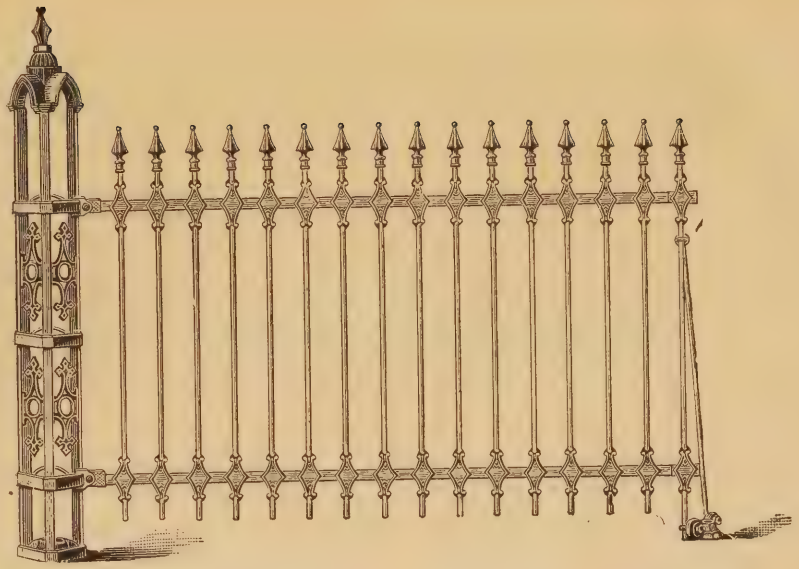
**STYLE 3.—Two Rail, with Bow-top Picket.**

This fence is plain but substantial, and is suitable for residences, etc. Made only of ⅜ square or ½ inch round picket. No. 2 Post.

(*For size of Rails, Pickets, etc., see Price List.*)



**STYLE 4.—Two Rail, with six inch bow and spear-top picket. In this fence we show the picket protected by the bow, thus preventing injury to children or stock.**

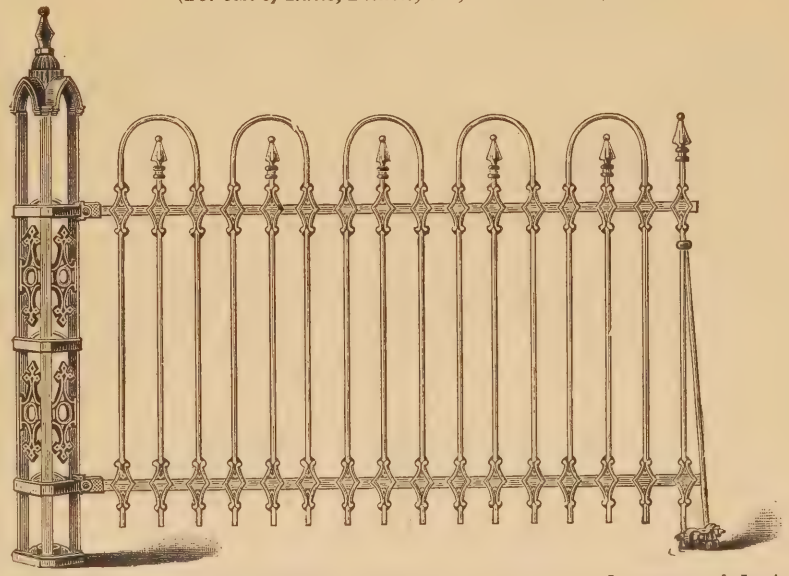


**STYLE 5.—Two Rail, with Spear Top Picket, Ornamental.**

Here we have a good, strong and well proportioned Fence, just ornamental enough to make it handsome. Style 5 is a great favorite.

(*For size of Rails, Pickets, etc., see Price List.*)





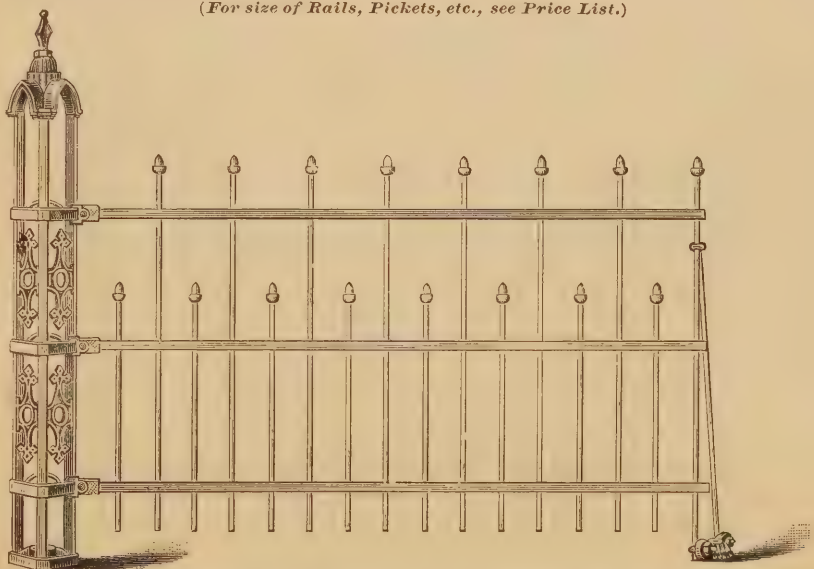
**STYLE 6.—Two Rail, with 6-inch bow, and spear picket, protected by the bow.**

**Very desirable and ornamental.**

**STYLE 7.—Three Rail, with Long and Short Pickets, Plain Top.**

This Fence is light and open, but sufficiently strong for Front or Division Fences, Cemetery Lots, etc., when a plain, neat Fence is desired.

(*For size of Rails, Pickets, etc., see Price List.*)



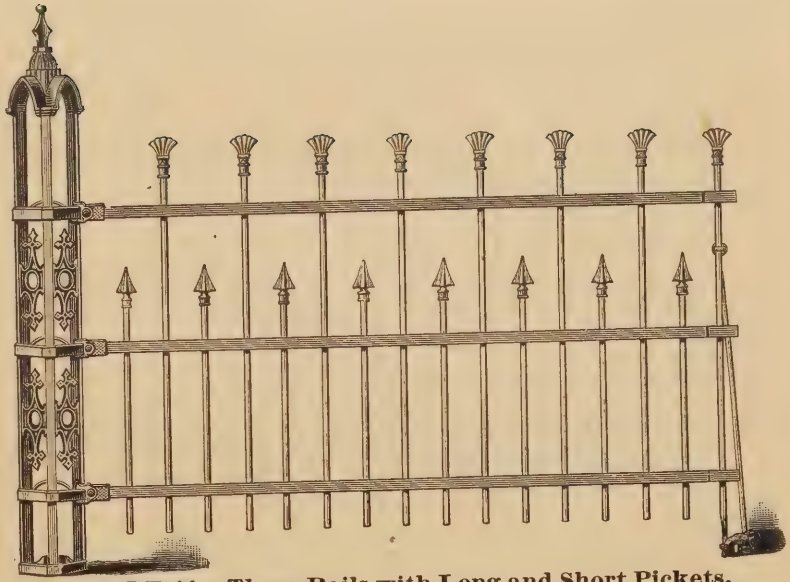
**STYLE 8.—Three Rail, with long and short pickets, acorn top. A plain but strong and substantial fence, suitable for residences, parks, public grounds, etc. For size of rails, pickets, etc., see price list.**

**STYLE 9.—Three Rail with Long and Short Pickets, Spear Tops**

This is one of the most desirable styles of Plain Fence we make. It is strong and durable, suitable for Residences, Public Grounds, Parks, etc. Chaste in appearance.

(*For size of Rails, Pickets, etc., see Price List.*)

**STYLE 10.—Three rail, with all long pickets, spear top. A very substantial and desirable style, suitable for school, church yards or court house grounds. Neat, strong and durable. For size of rails, pickets, etc., see price list.**



**STYLE 11.—Three Rails with Long and Short Pickets.**

This style is similar to style 9 with east-lake top on long picket and Roman spear on short picket, it being one of our latest styles and is very much admired.

*(For size of Rails, Pickets, etc., see Price List.)*

**STYLE 12.—Three Rail, with six and one-half inch bow and spear pickets.**

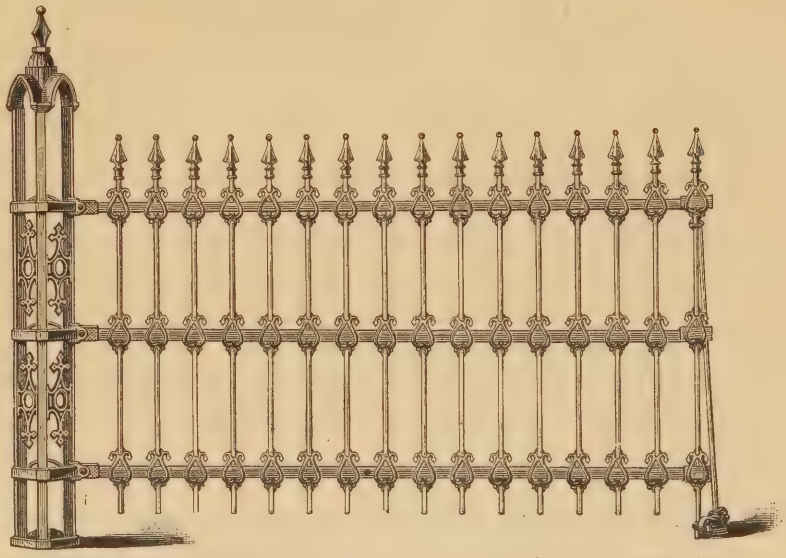
We cannot say too much in favor of this fence. It is a very desirable and durable style. The tops of pickets are protected by the bow, preventing injury to children or stock.

**STYLE 13.—Three Rail, with Long and Short Pickets, Spear Top.**

Although not so elaborate as some ornamental styles, yet the Harp Ornament makes a very neat pattern. This ornament is something very much admired.

(*For size of Rails, Pickets, etc., see Price List.*)





**STYLE 14.—Three Rail, with all long pickets, spear top.**

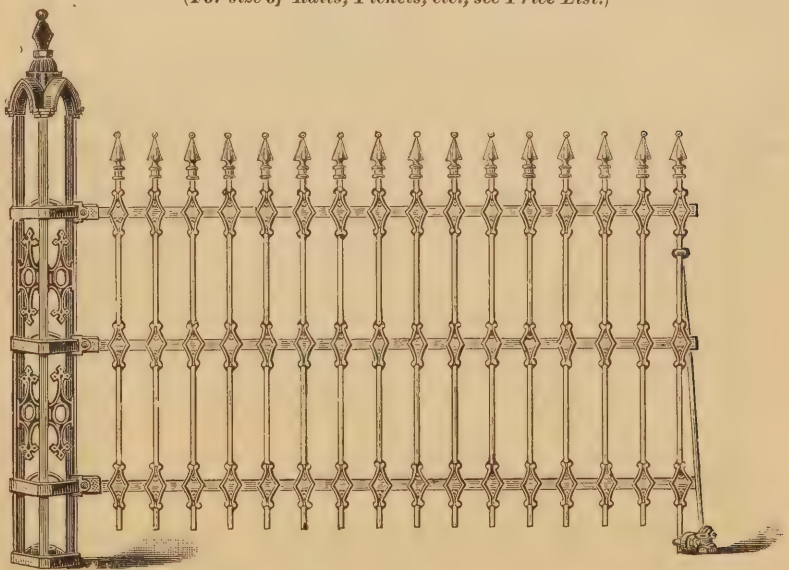
**This pattern is similar to Style 13, except it has all long pickets. Both styles are strong and durable, and suitable for residences. For size of rails, pickets, etc., see price list.**

**STYLE 15.—Three Rail, Long and Short Pickets, Spear Top.**

We can recommend this style as a strong and substantial Fence. It presents a bold appearance and always pleases the eye.

(*For size of Rails, Pickets, etc., see Price List.*)





**STYLE 16.—Three rail, with all long pickets, spear top.**

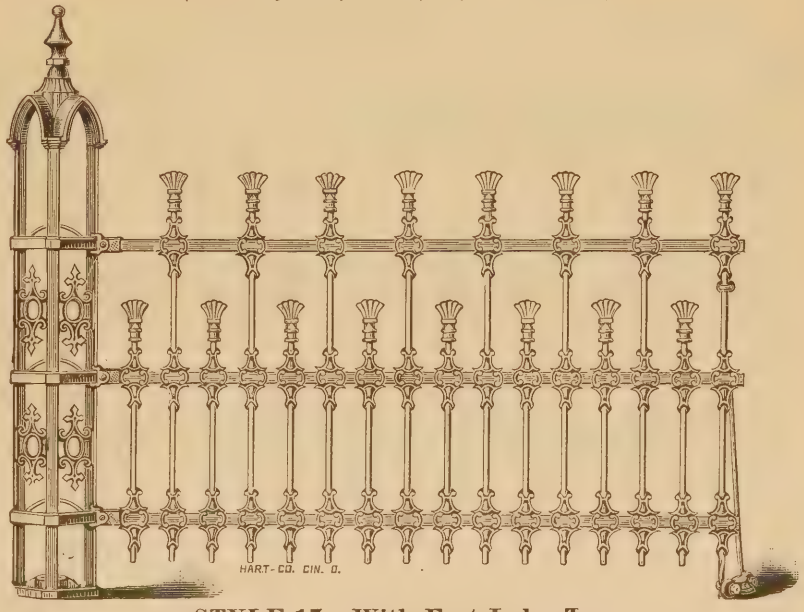
**This fence, when erected, presents a bold and beautiful appearance. A handsome and durable fence.**

**STYLE 17.—Three Rail, with Long and Short Pickets, Spear Top.**

This is a new design, handsome and attractive. On this Fence we use our most elaborate ornament. It substantial and presents a bold and attractive appearance.

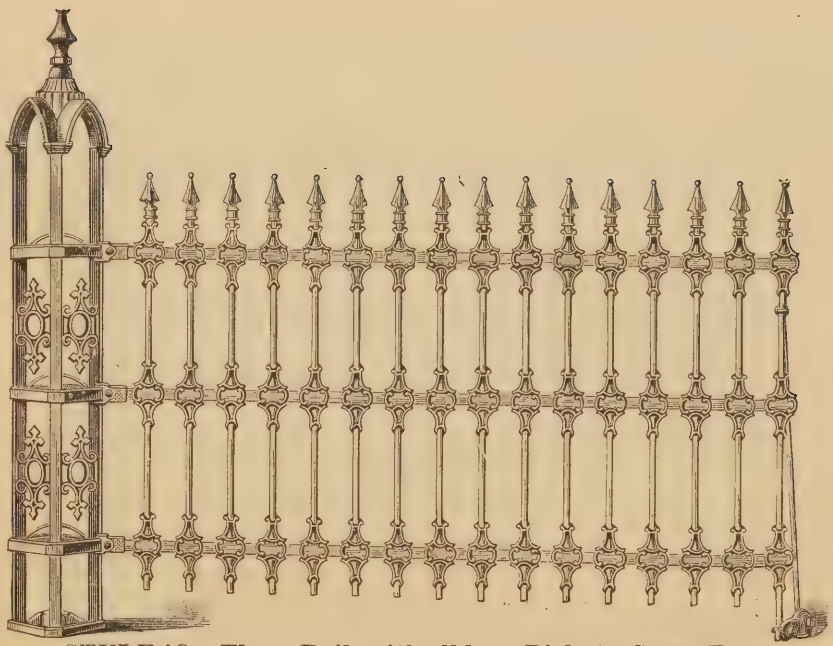
(*For size of Rails, Pickets, etc., see Price List.*)






**STYLE 17.—With East Lake Top.**

**Three Rail, with long and short pickets; East lake tops. This is one of our latest styles, and is very beautiful in appearance.**

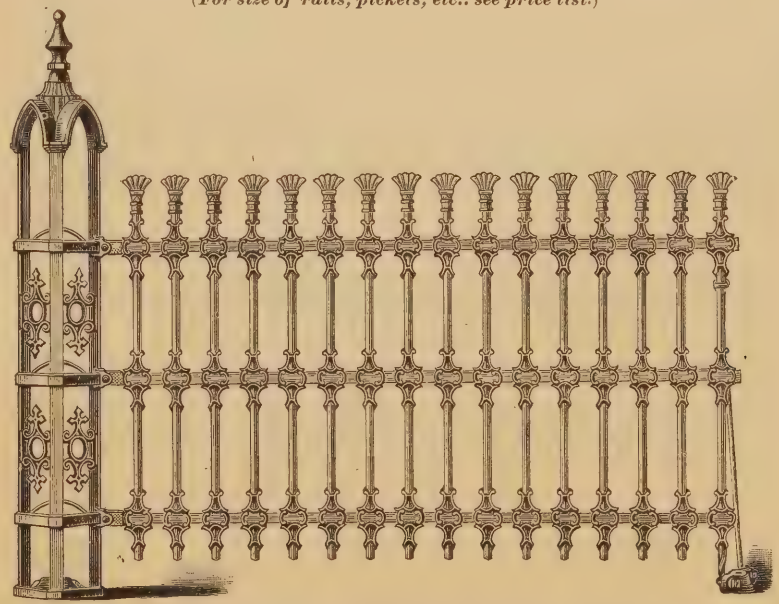


**STYLE 18.—Three Rail, with all long Pickets, Spear Top.**

This style is the heaviest pattern we make; the design is entirely new. Those who wish a substantial and beautifully ornamented Fence, will find our Style 18 is just what they want.

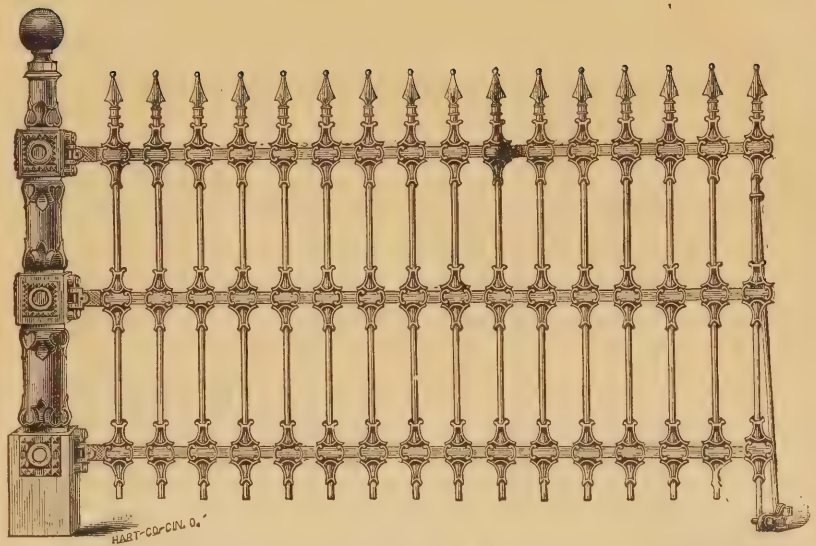
(*For size of rails, pickets, etc.. see price list.*)





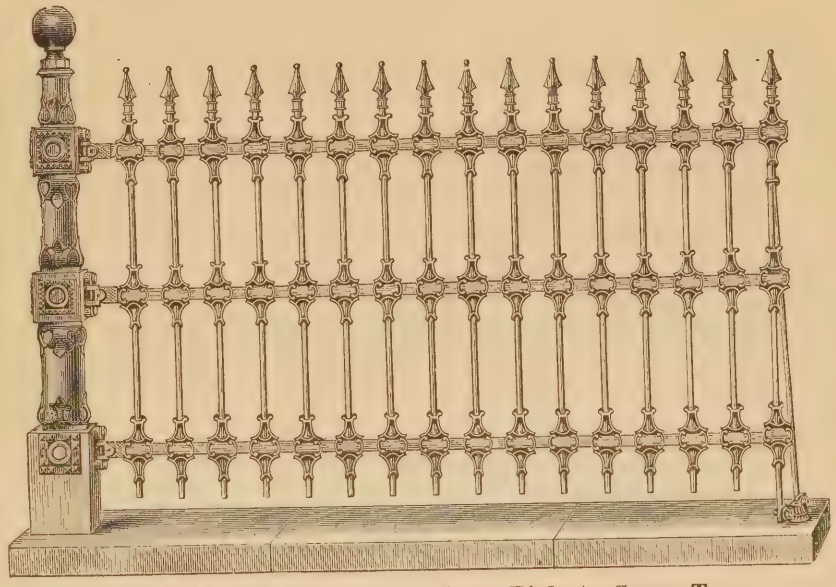
**STYLE 18.—With East Lake Top.**

**Three Rails, all long pickets, East Lake top. A new design, substantial and beautiful. For size of rails, pickets, etc., see price list.**




**STYLE 18.—Three Rail, with No. 5½ Fancy Square Corner Post. A substantial and beautifully ornamented fence.**

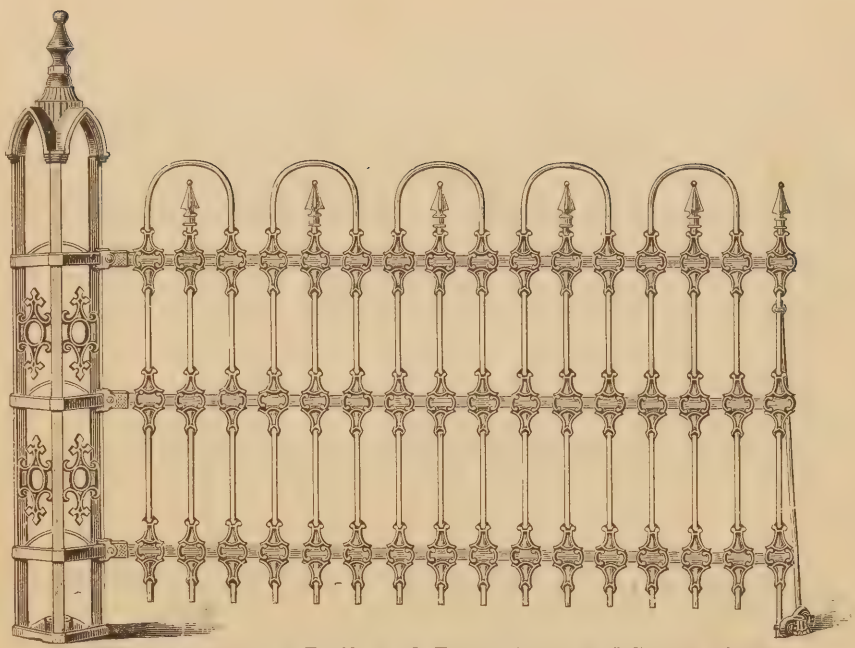




**STYLE 18.—Three Rails, all Long Pickets, Spear Tops.**

With this style, we show our No. 5½ Fancy Square Corner Cast Iron Post set on stone coping or flagging. Any style fence that we make can be erected in a similar manner.

*(For size of rails, pickets, etc., see price list.)*

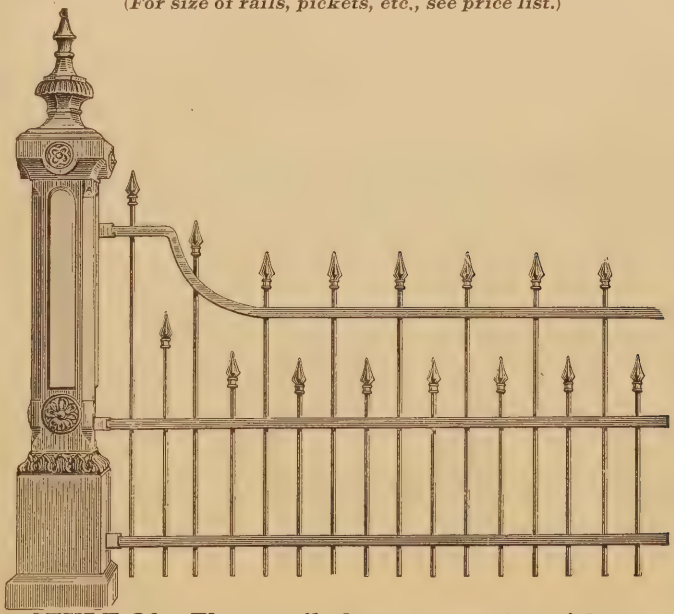


**STYLE 19.—Three Rail, with Large Bow and Spear Picket.**

This is a new and popular style of Fence, universally admired. The design is of the latest pattern, and when erected presents a handsome appearance. The Bow adds strength and beauty.

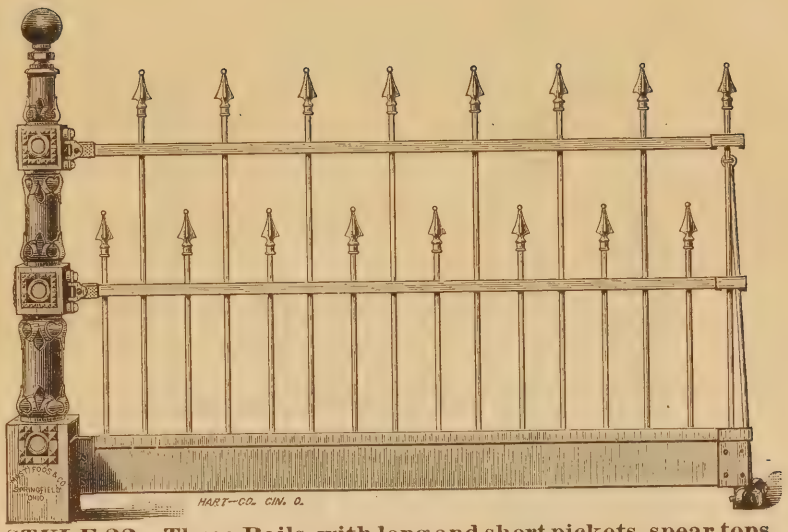
*(For size of rails, pickets, etc., see price list.)*



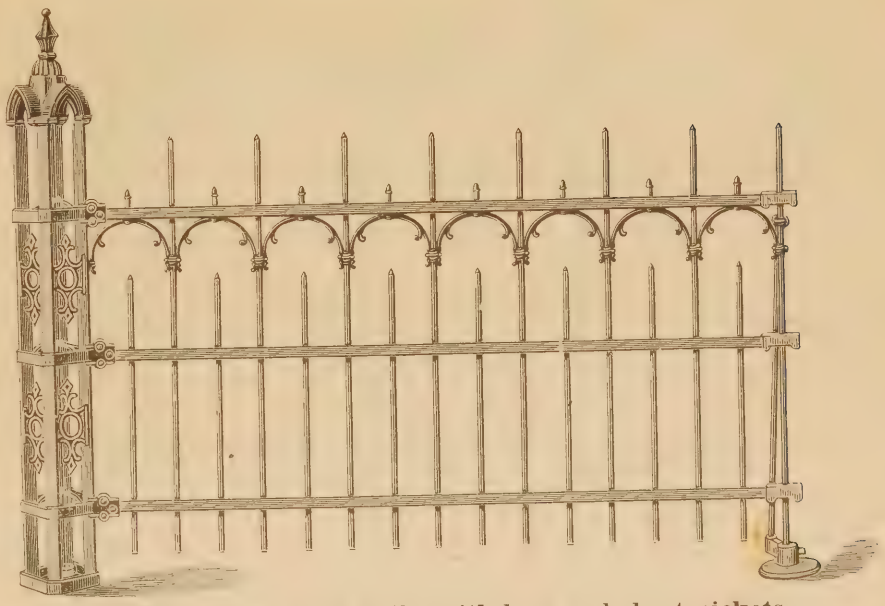


**STYLE 20.—Three rail, heavy spear-top picket.**

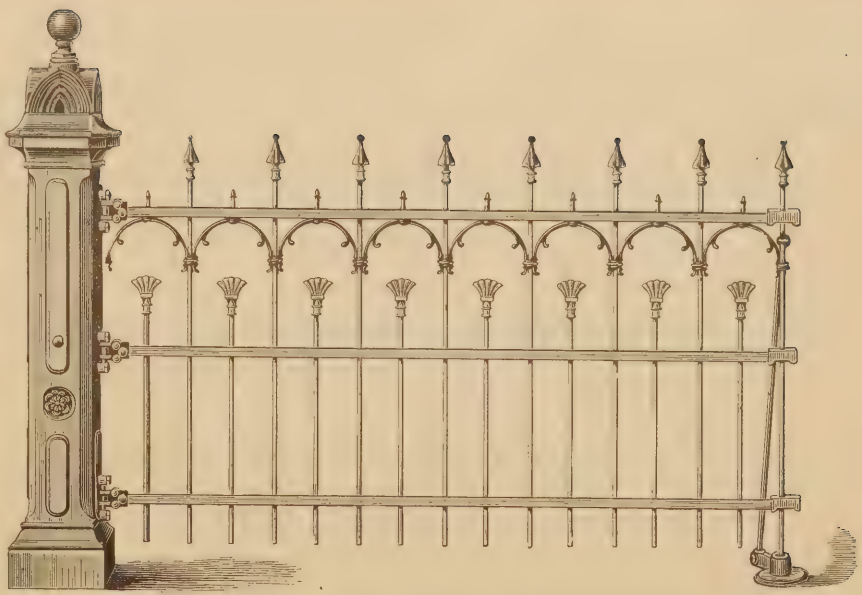
**A strong, heavy fence, suitable for public parks, school buildings, court houses, and other public buildings. With this style we show our large No. 7 Ornamental Cast Post.**



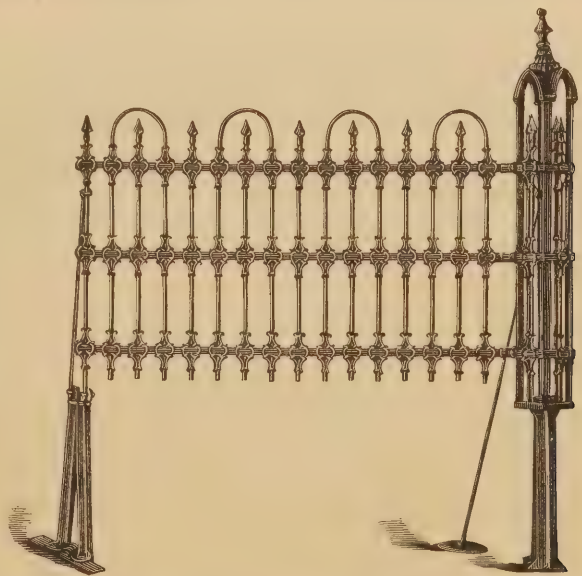

**STYLE 22.—Three Rails, with long and short pickets, spear tops. With this style we show our No. 5½ Fancy Square Corner Cast Iron Post and Wrought Iron base board. This style is suitable for a close bottom fence or where a base board is required.**



**STYLE 23.—Three Rails, with long and short pickets. Ornaments under top rail, No. 2 Post. This is a new ornament and can be used on our style 7, 8, 9, 11, 13 or 22 Fences.**

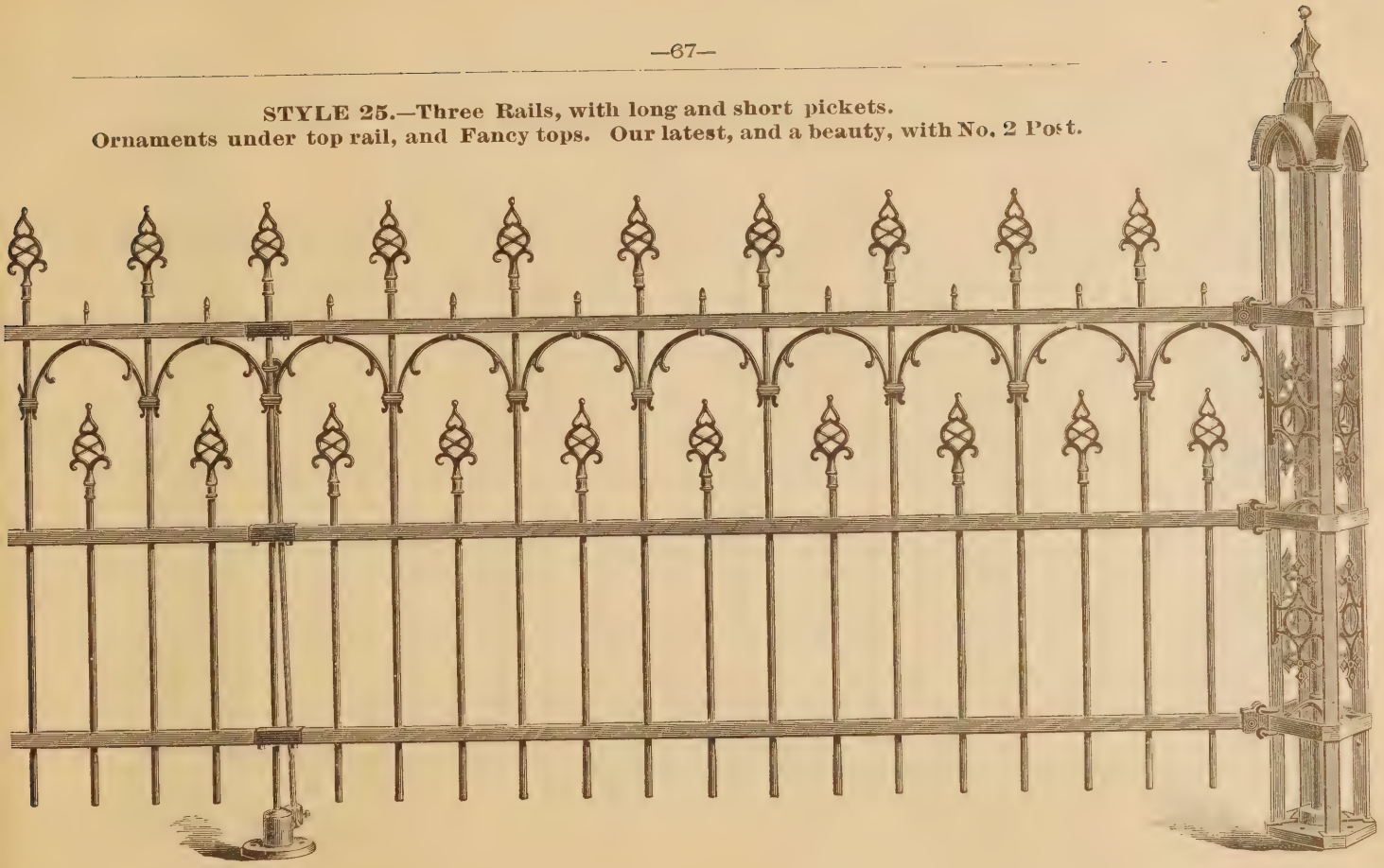


**STYLE 24.—Three Rails, with long and short pickets. Ornaments under top rail, No. 8 Post. This fence can be made with Nos. 2, 4, 5, 5½ or 8 Posts.**



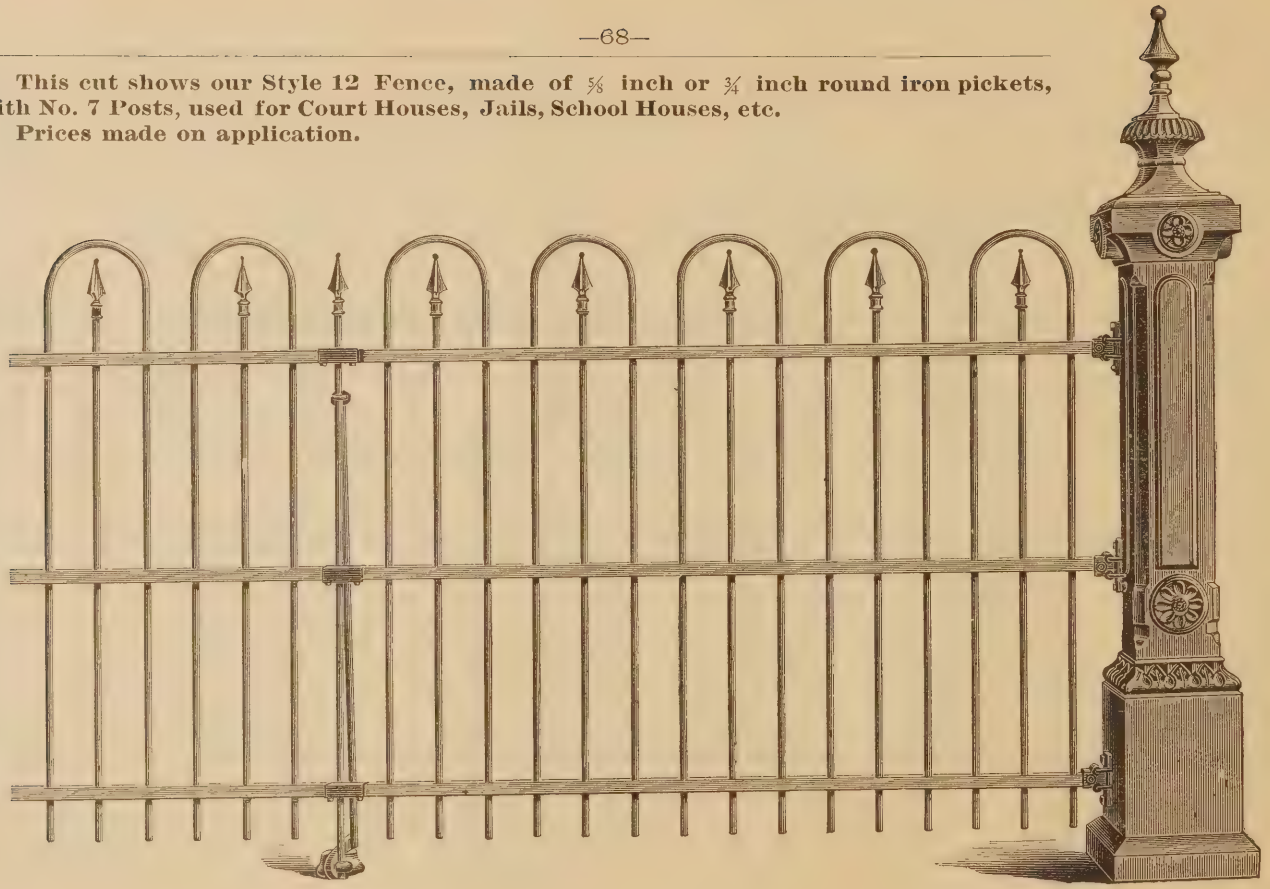
This plate represents Style 19½ showing a five foot panel with Corner Post, Brace and Line Post attached to the Iron Foundations, which go into the ground. Our Iron Foundations are so constructed that the frost will not move them—therefore the Fence stands solid and always in line.

**STYLE 25.—Three Rails, with long and short pickets.**
**Ornaments under top rail, and Fancy tops. Our latest, and a beauty, with No. 2 Post.**

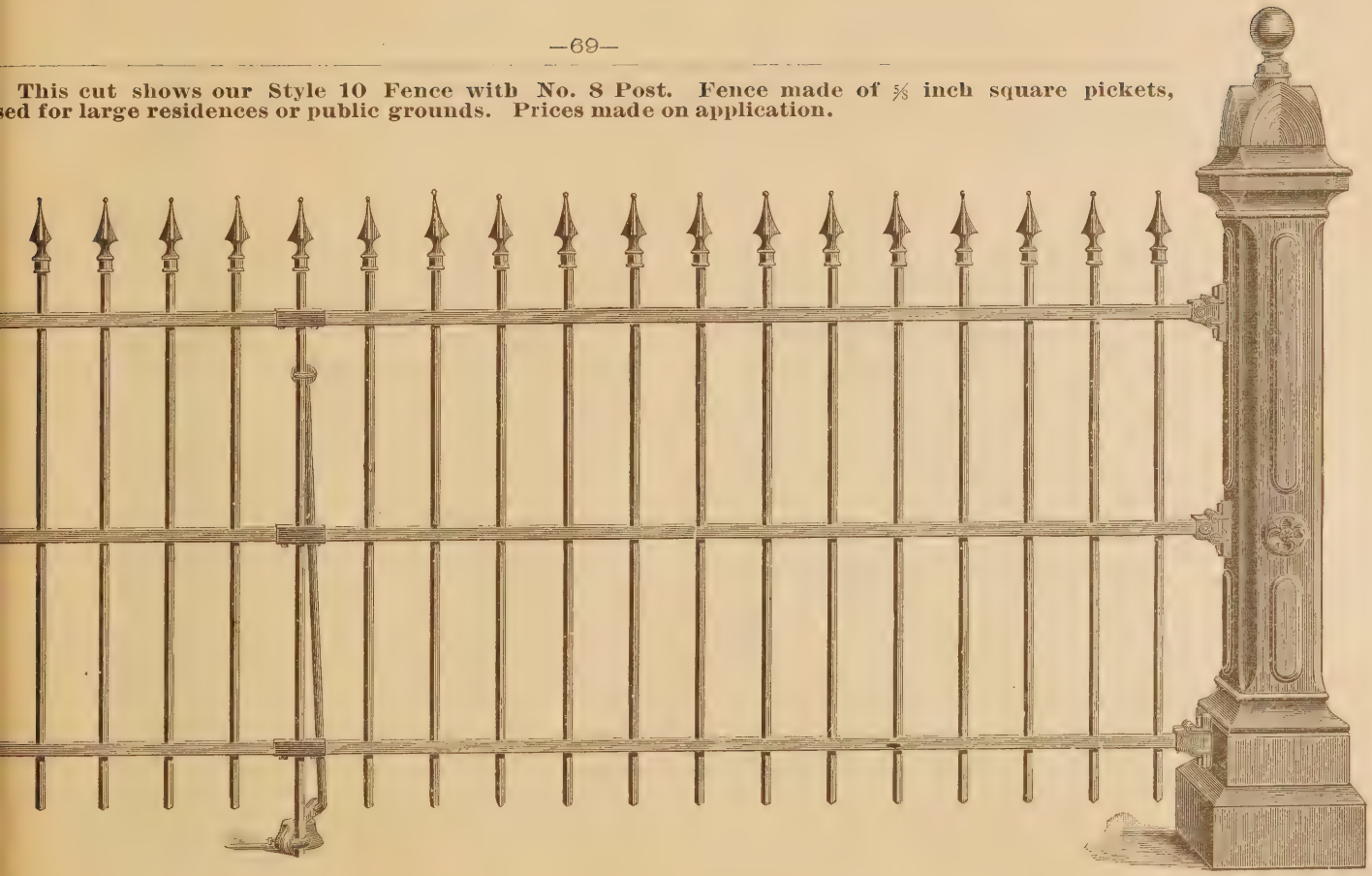


**This cut shows our Style 12 Fence, made of ⅝ inch or ¾ inch round iron pickets, with No. 7 Posts, used for Court Houses, Jails, School Houses, etc.**

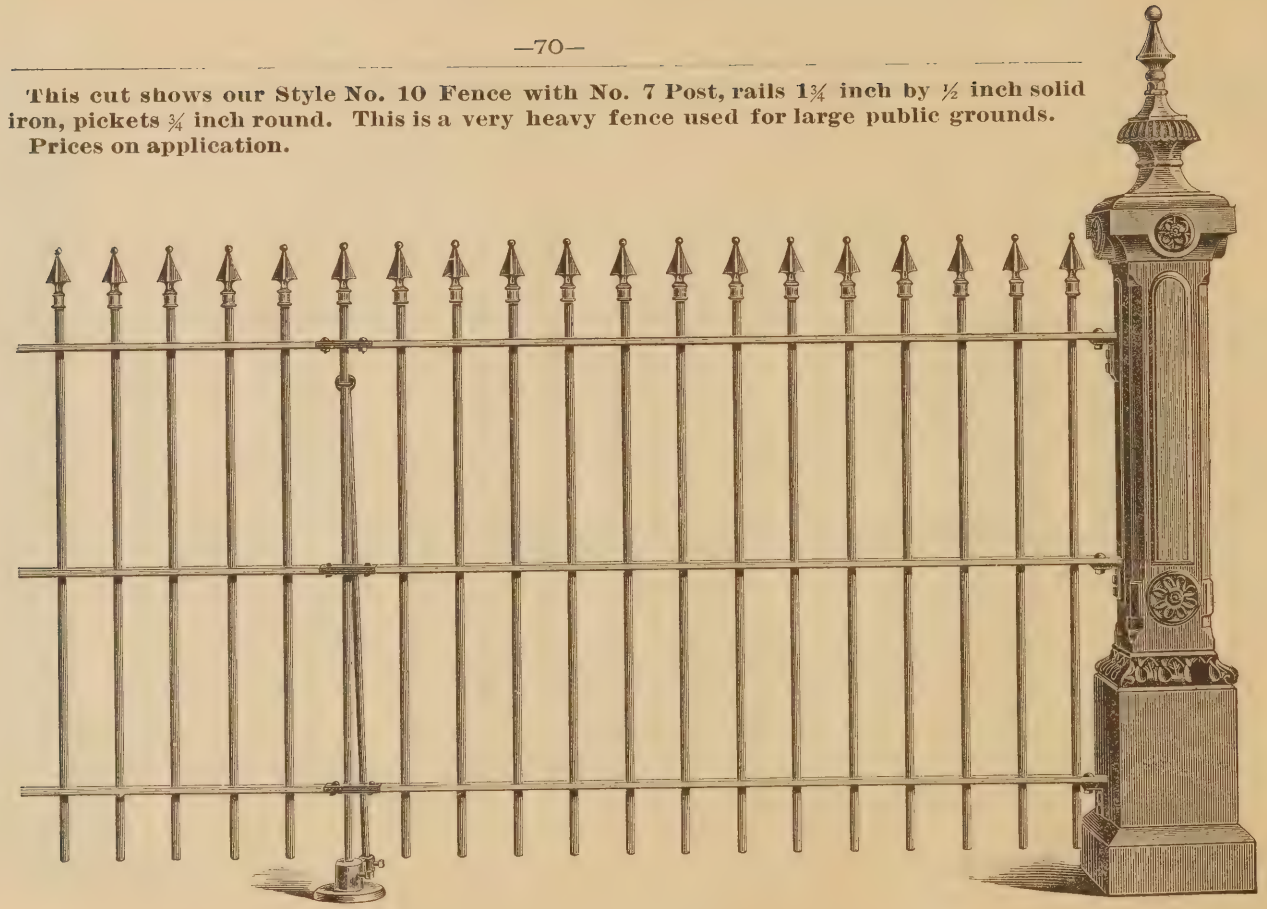
**Prices made on application.**



This cut shows our Style 10 Fence with No. 8 Post. Fence made of ⅝ inch square pickets, sed for large residences or public grounds. Prices made on application.



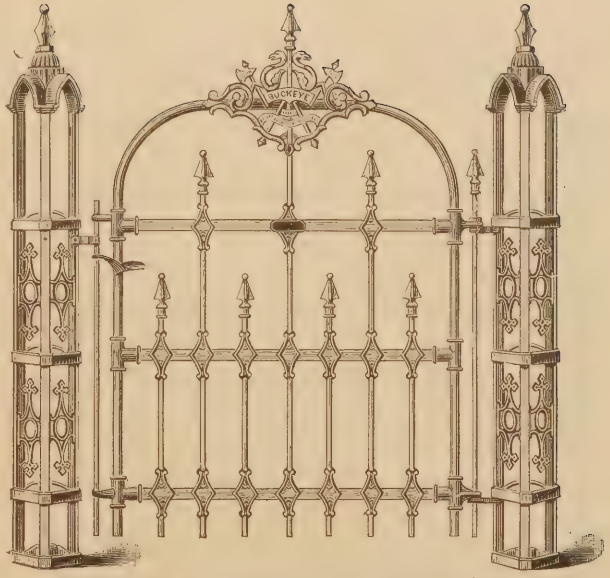
**This cut shows our Style No. 10 Fence with No. 7 Post, rails 1¼ inch by ½ inch solid iron, pickets ¾ inch round. This is a very heavy fence used for large public grounds. Prices on application.**



**GRADED FENCE.**—This cut represents our Style 2 Fence on a grade. Any style of our Buckeye Fences can be graded in a similar manner, at the will of purchaser, at any time.

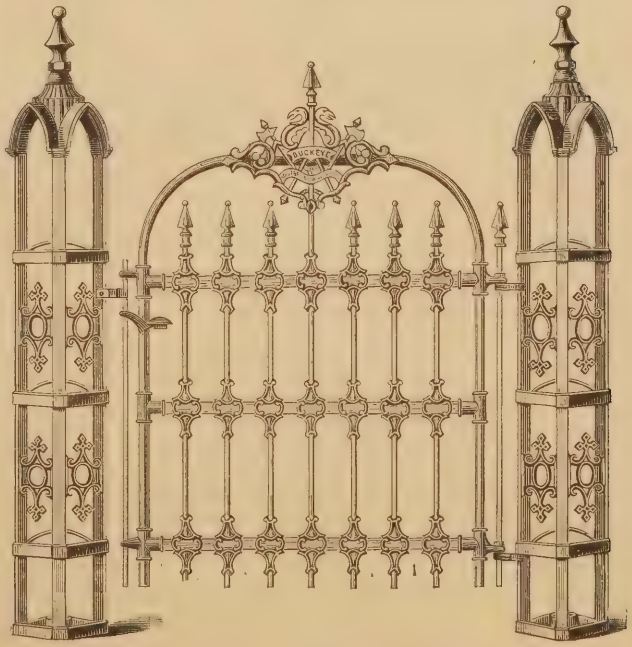
**STYLE 1.—Plain Walk Gate.**

Our Gates are all Three Rail, and firmly built; the outside bow or frame being all one piece makes them very strong, and they will always keep their shape.




**STYLE 2.—Ornamental Walk Gate.**

With this Gate we furnish 6-inch posts, ornamented. Very handsome when erected.

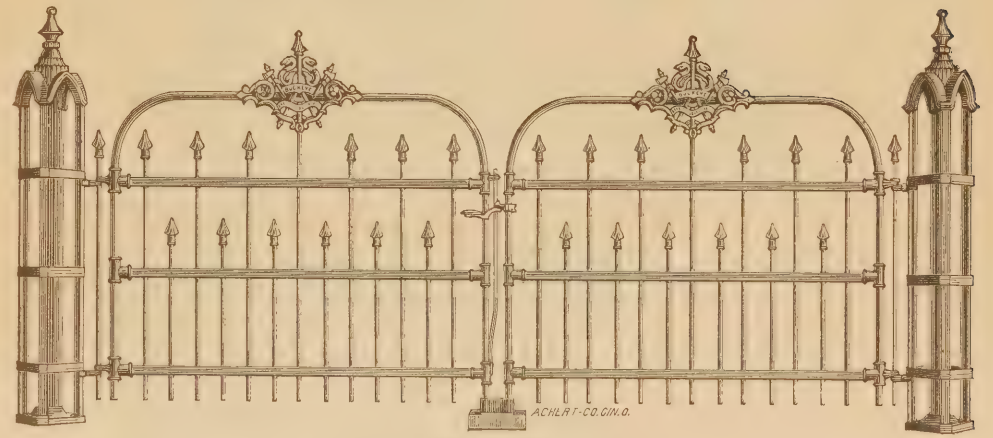



**STYLE 3.—Heavy Ornamental Walk Gate.**

With this Gate we furnish heavy 8-inch Posts, heavily ornamented, both Gate and Posts, to match. Are very handsome when erected.

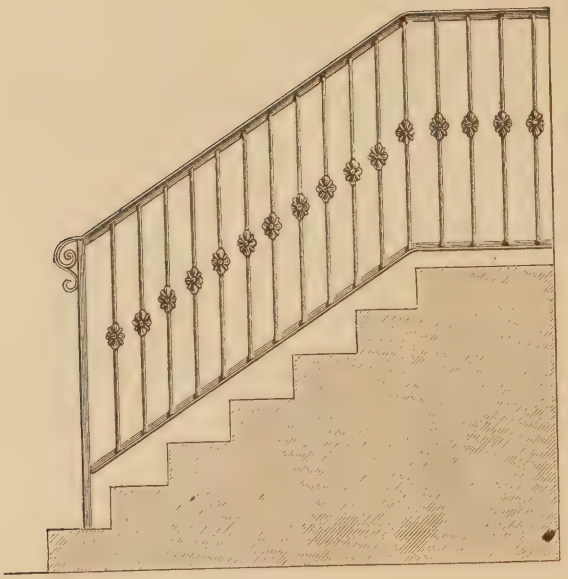
## DOUBLE WALK GATES

We show a set of Double Walk Gates, plain. We can furnish them ornamented similar to Style 2 or 3, as our customers may desire. We use the new style Post with these gates, same as shown in single walk gates.



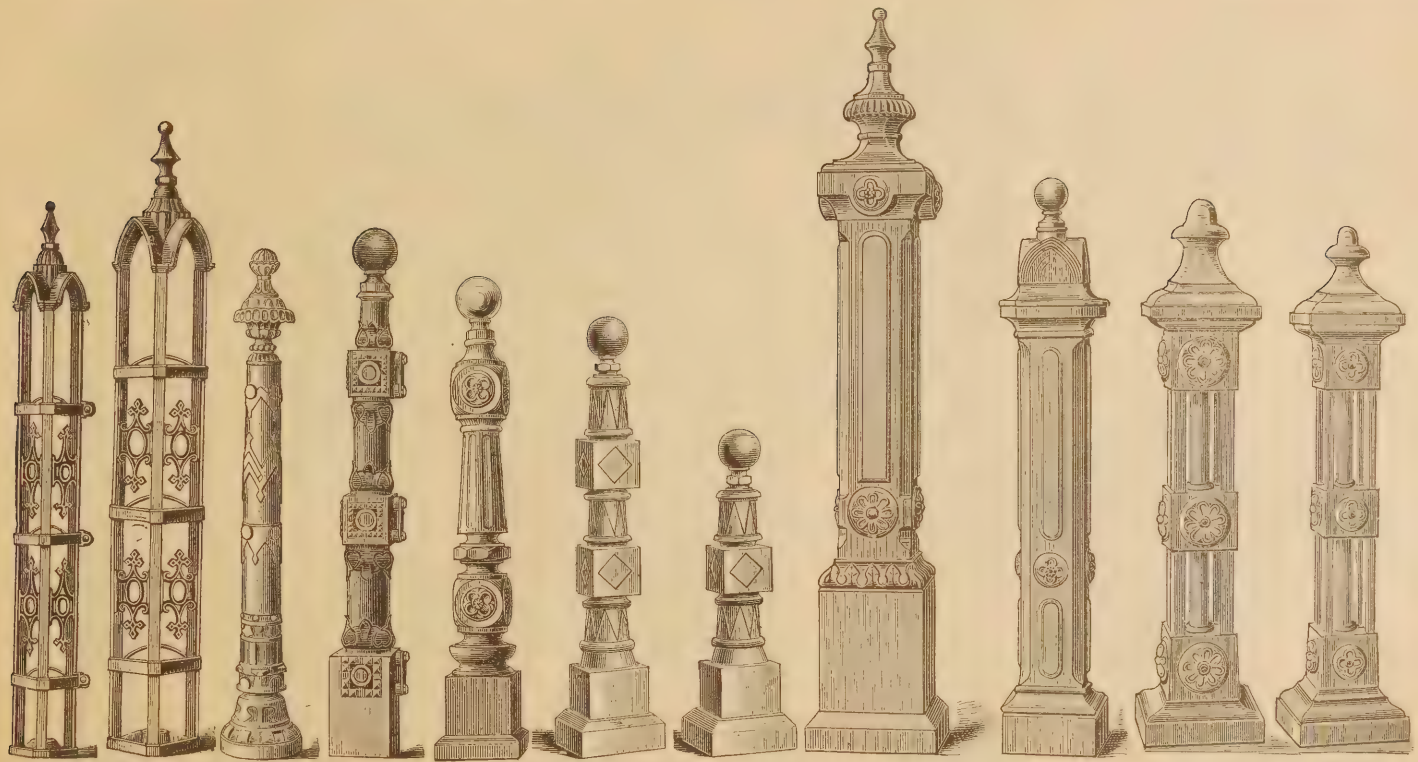

## DOUBLE DRIVE GATES.

The gates shown in this cut are plain. We will furnish the same gates heavily ornamented, to match any style of fence. We use the new style Post with these gates, same as shown in single walk gates



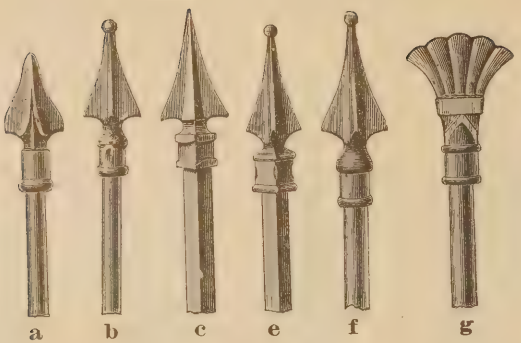
**No. 1.—PLAIN STAIR RAILING.**
**With Plain Post and Rosette Picket**

**No. 2.—FANCY STAIR RAILING.**
**Showing No. 5 Fancy Cast Post and Ornan ed Pickets. We will ornament these railir any style desired.**

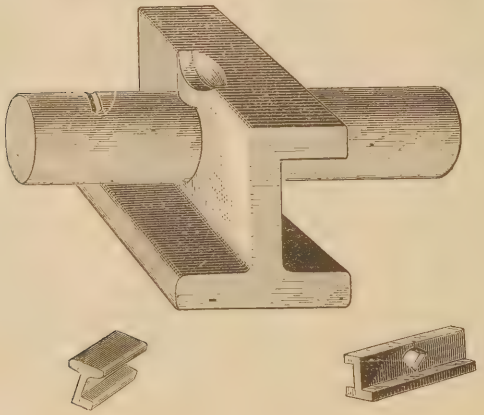


No. 2. No. 4. No. 5. No. 5½. No. 6. No. 6½ Long. No. 6½ Short. No. 7. No. 8. No. 9. No. 10.

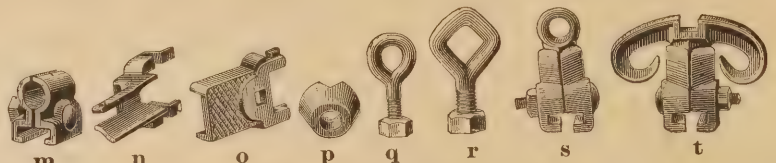
FENCE, GATE AND CORNER POSTS.




Styles of Spears used in the Buckeye Iron Fence.



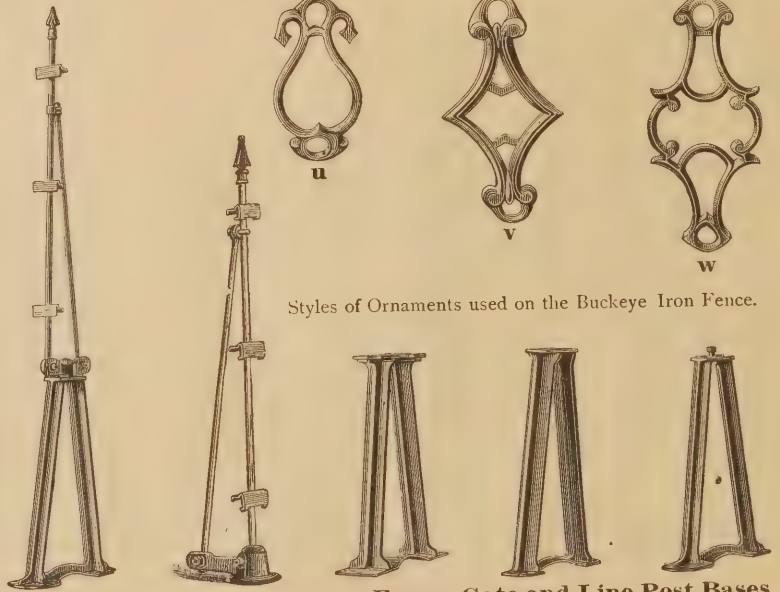
Sections of Rails used in the Buckeye Iron Fence.



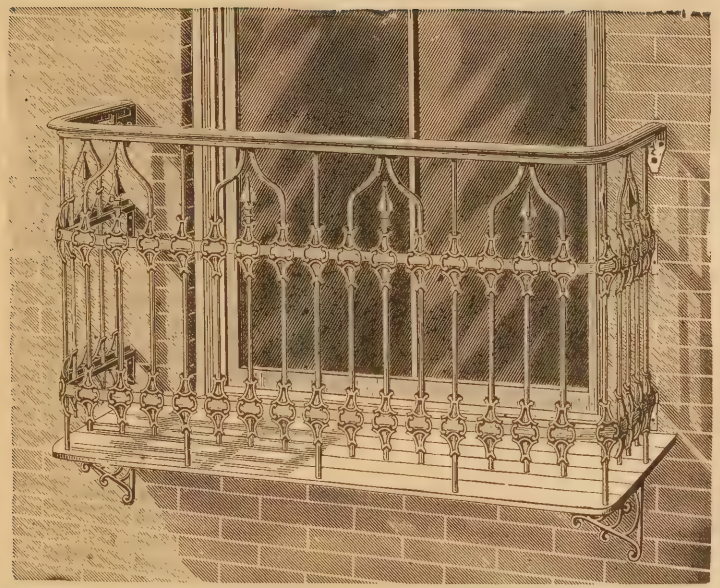

Extra Parts used in the Buckeye Iron Fence.



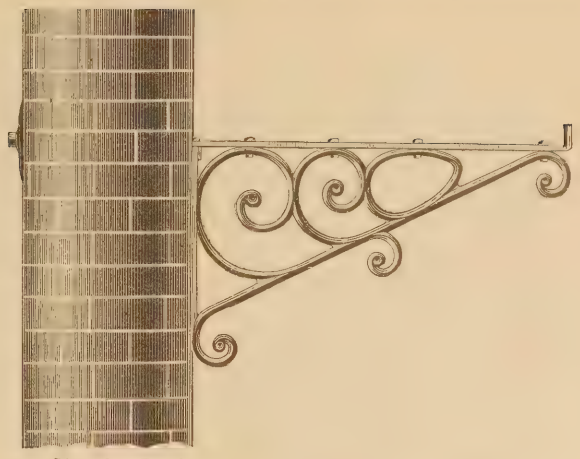

Styles of Ornaments used on the Buckeye Iron Fence.



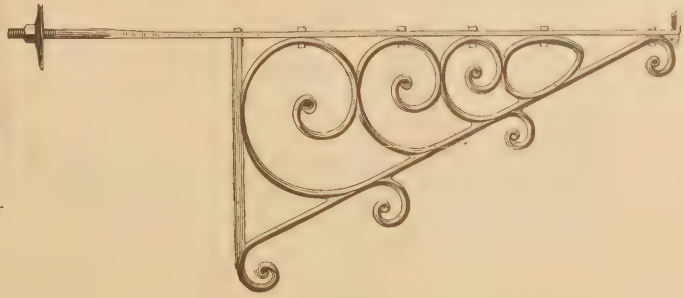
Showing Line Posts and Bases complete. **Fence, Gate and Line Post Bases.**



**BALCONY RAILING,** suitable for window balconies, verandas or porches. Can be made to represent any style of fence shown in Catalogue.



**No. 1.**—Bracket attached to wall, ready for Balcony.



**No. 2.**—Bracket, complete, ready for wall.

**STYLE 0.**

**Cresting, 12 inches high; Finial, 22 inches high.**

**STYLE 1.—Cresting, suitable for verandas, bay windows, etc. Cresting 12 inches high, Finials 22 inches high.**

**STYLE 1½.—Iron Cresting.**

One of our latest patterns. Neat and tasty. Suitable for Bay Windows, Cottages and Private Residences. Cresting 18 inches high. Finials 36 inches high.

**STYLE 2.—Iron Cresting.**

Beautiful design, suitable for Churches, School Houses or Private Residences. Cresting 18 inches high. Finials 34 inches high.

**STYLE 2½.—Iron Cresting.**

New design *without Finial.* Suitable for Cottages, Private Residences, etc. Cresting 26 inches high.

**STYLE 3.—Iron Cresting.**

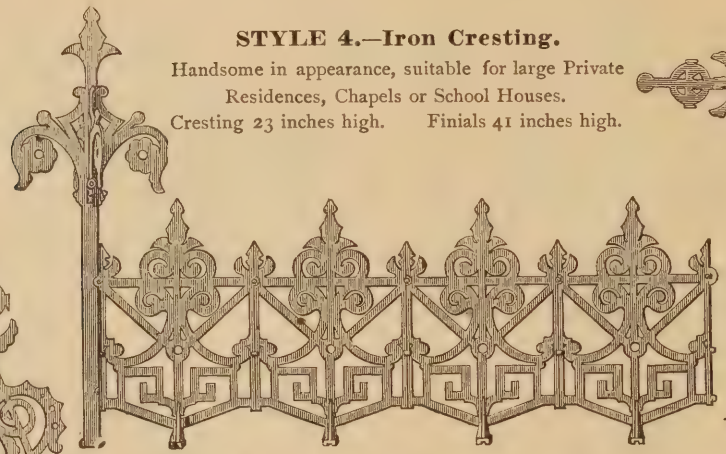
New design, suitable for Cottages and Private Residences of Gothic design. Cresting 20 inches high. Finials 35 inches high.

**STYLE 3½.—Cresting.**

A new and handsome design, suitable for Private Residences, Churches, Public Buildings, etc. Cresting 30 inches high. Finials 39 inches high.

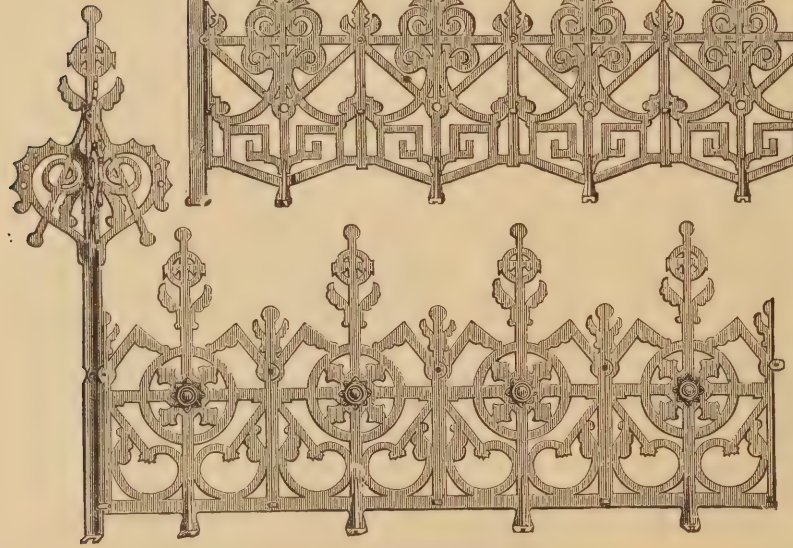
## STYLE 4.—Iron Cresting.

Handsome in appearance, suitable for large Private Residences, Chapels or School Houses.
Cresting 23 inches high. Finials 41 inches high.



## STYLE 5.—Cresting.

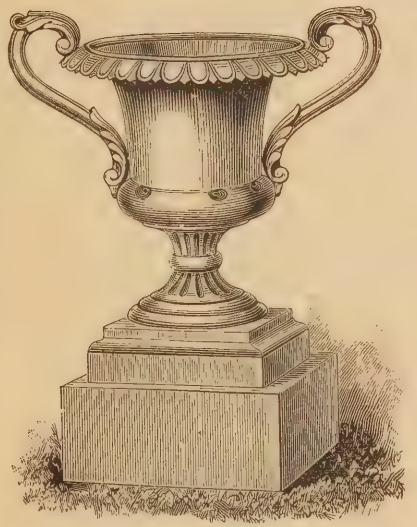
New and elegant design, suitable for Public Buildings, Churches or Private Residences. Cresting 30 inches high. Finials 51 inches high.



## FINIALS—For Cresting.

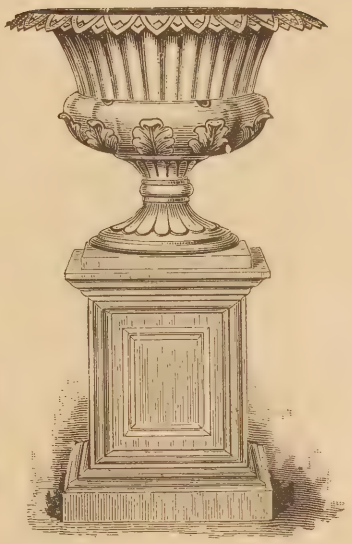
**No. 1.—Tower Ornament.**—Cast iron, 6½ ft. high, with wrought iron base.

**No. 2.—Tower Ornament.**—Galvanized iron, 8 ft. high, with wrought iron base.



**No. 1 Vase.**

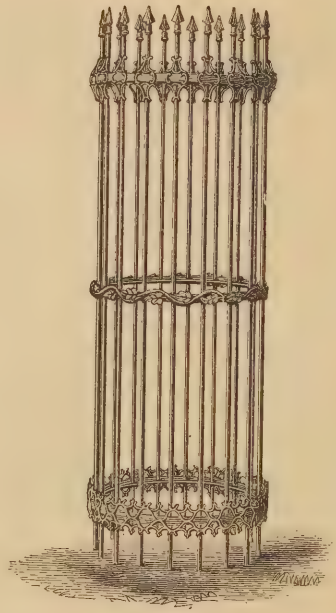
Height 34 inches; diameter 19 inches; width including handles 28 inches. With or without pedestal.



**No. 2.—(Patent Reservoir) Vase.**—Height 34½ inches; diameter 22 inches. With or without pedestal.

**Send for Special Catalogue on Vases.**

No. 1.



No. 2.

**We make these Guards any size required.**

Cut No. 1 shows Tree Guard before placing in the ground.
Cut No. 2 shows Tree Guard placed in position.
We can make Flare Tops to these if desired.

No. 1

No. 2.

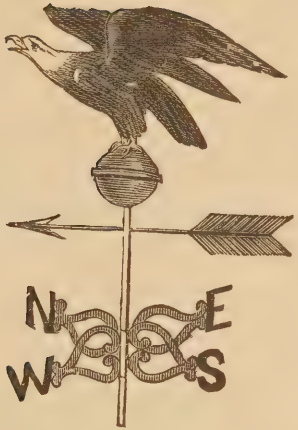
No. 3.

No. 4.

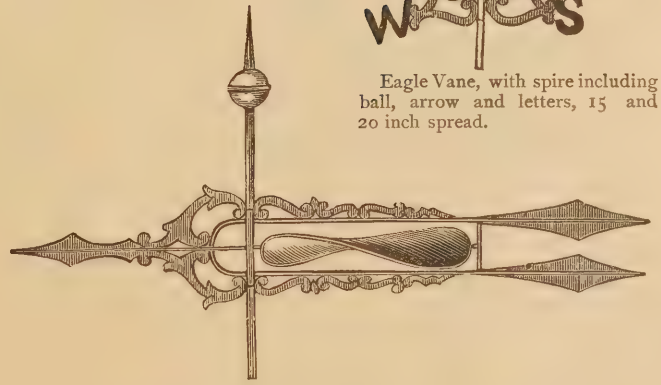
**HITCHING POSTS.**

Pen Vane, plain, with or without spire, ball and letters. Two and 3 feet spread.

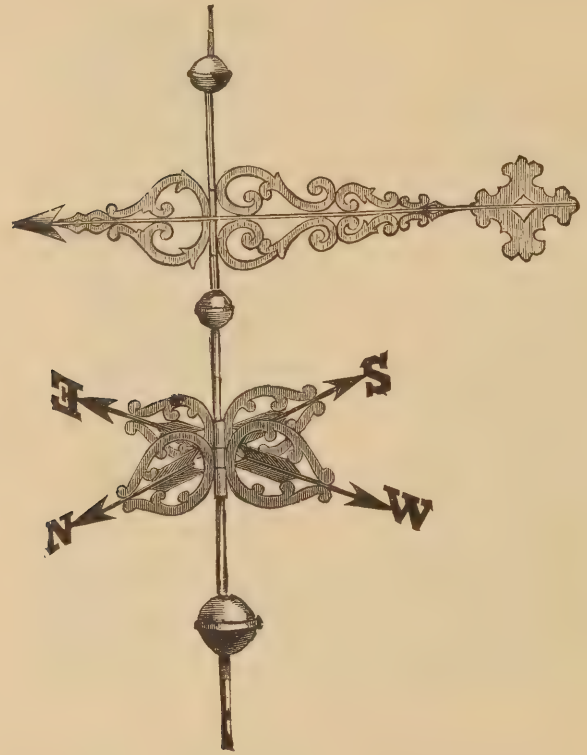
Spire Vane with ball and letters, two feet spread.



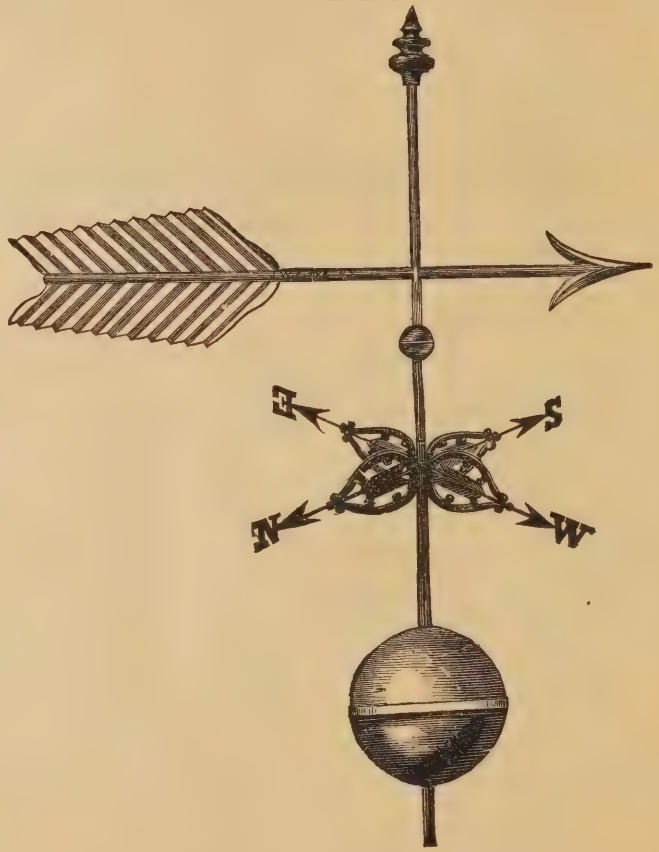

Eagle Vane, with spire including ball, arrow and letters, 15 and 20 inch spread.



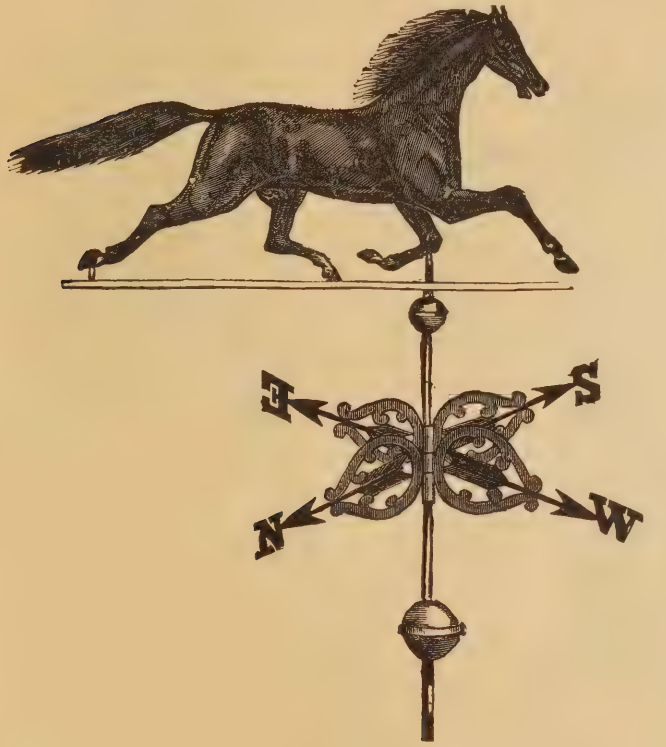
Revolving Vane ; Mounted complete as shown above. Four feet two inch spread. Copper Vane gilded with pure gold leaf.



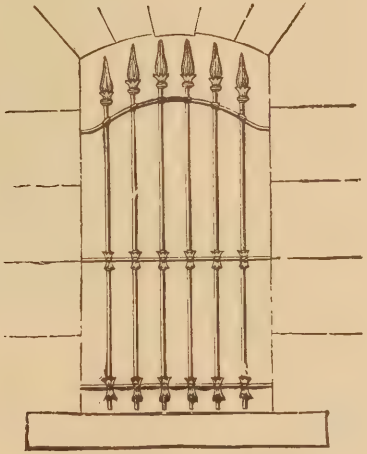

Scroll Vane. Twelve and 24 inch spread. Copper Vane gilded with pure gold leaf.




Arrow Vane. From 12 to 36 inch spread. Copper vane gilded with pure gold leaf.




Ethen Allen Vane. 31 inch spread. Copper Vane gilded with pure gold leaf.



**WINDOW GUARDS.**

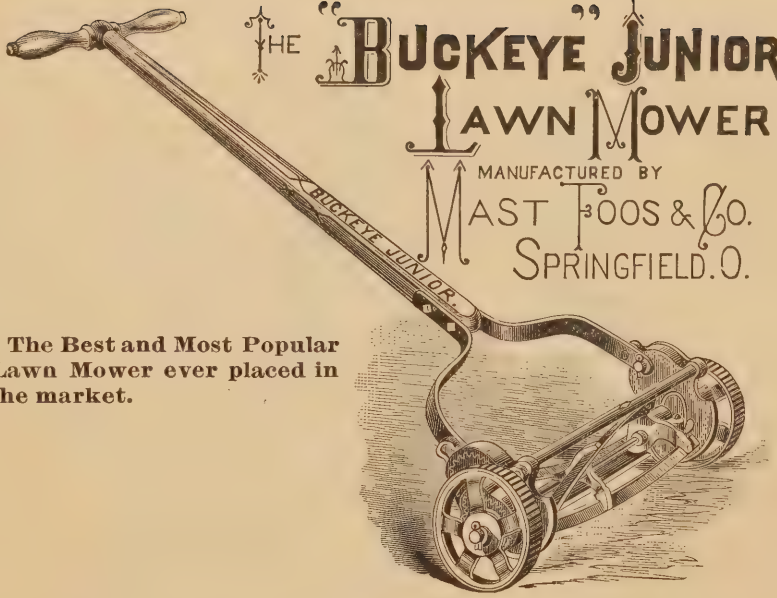
We make these Guards to represent any style or design of fence shown in our catalogue and of any height or width desired.
Prices on application.

# THE "BUCKEYE" JUNIOR LAWN MOWER

MANUFACTURED BY

MAST FOOS & CO.

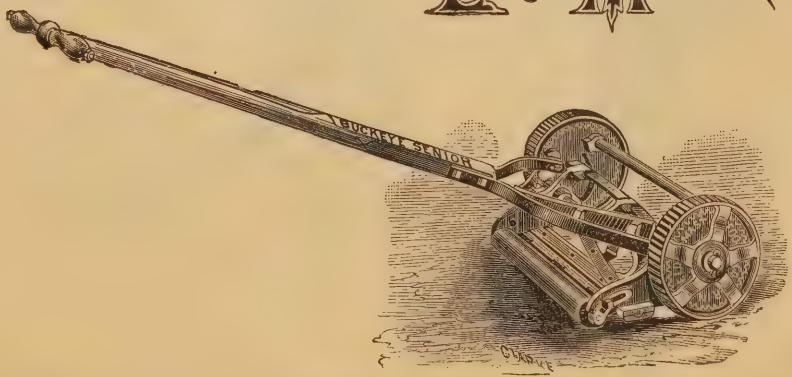
SPRINGFIELD. O.




**The Best and Most Popular Lawn Mower ever placed in the market.**

**Made in four sizes. 10 inch, 12 inch, 14 inch and 16 inch Cut.**

# THE "BUCKEYE" SENIOR LAWN MOWER




**Made in Five Sizes. 10 inch, 12 inch, 14 in., 16 in. and 18 in. Cut.**

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# Peaches

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